

NetworkWorld

**Desktop
ATM**
25M bit/sec ATM
Is failing to catch
on. Page 25.

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING IN THE DUMPS

Digital

Special FBI units hunt
for computer criminals
— and urge you to
do your part.

By Charles Bruno

If Ken Geide or any of his posse shows up on your data center doorstep, odds are you're not going to have a banner day.

Geide is section chief of an elite unit of the Federal Bureau of Investigation that assesses and battles computer crimes. The Computer Investigation and Infrastructure Threat Assessment Center (CITAC) works with FBI field offices to crack cases by probing deep into computer networks.

See FBI, page 68

The FBI's Charles Owens (left) and Ken Geide want to help you win the war against computer crime. "We're ready now," Geide says. "Give us a chance."

detectives

A CALL TO ACTION ANSWERED . . .

In March, we gave our take on how the feds should shape policy for 'Net business (NW, Mar. 31, page 1). Last week, the Clinton administration issued its policy.

Network World called for:

- ▶ The Internet to be a tax-free zone
- ▶ The definition of trademark and copyright protection
- ▶ Industrywide encryption consensus

Clinton's plan called for:

- ▶ No taxes on goods sold over the 'Net
- ▶ Property right protection for 'Net applications
- ▶ Continued 56-bit encryption restrictions

See
story,
page 6.



NC camp failing to win over ISPs

By Denise Pappalardo

The relentless hype about network computers (NC) may have excited the industry, but it certainly has not charged up Internet service providers, which are not planning any special services for NCs for at least another year.

And that lackluster attitude may undermine one of the long-term benefits of NCs — being able to plug into the Internet and go.

In order for an NC user to truly exploit the World Wide Web, an ISP will have to be able

Larryspeak

A year and a half ago, Oracle CEO Larry Ellison proclaimed that the company would help launch InterWorld, a global Internet service for network computer users. InterWorld, to be built with the help of "huge telecom companies" and a "gigantic news media company," was to be finished by September 1996 but so far has not materialized.



to serve up applets or offer a bundled service that combines an NC, browser and access. However, key ISPs still are not too pumped on NCs, and that will not get better anytime soon.

Oracle Corp. CEO Larry Ellison has consistently predicted that carriers and ISPs would jump on the NC wagon with special services and bundling deals.

See NC, page 16

DSL standard promises to force T-1 prices down

By Tim Greene

A new network access technology is emerging that could drive down T-1 prices.

The technology, dubbed high-bit-rate digital subscriber line 2 (HDSL2), boasts the same 1.544M bit/sec capacity of a standard T-1 line. But because HDSL2 uses one pair of copper wires rather than the two employed by a standard T-1, carriers should be able to provide HDSL2-based T-1 service more cheaply.

Three companies — ADC Telecommunications, Inc., Pair-Gain Technologies, Inc. and Level One Communications, Inc. — last week jointly submitted an HDSL2 standard proposal to ANSI. This proposal is based on technology from Adtran, Inc., which quietly made an HDSL2 proposal of its own in January.

Observers expect a standard to gel later this year; HDSL2-compliant products should be

See HDSL2, page 69

It's academic: Have my agent call your agent



By Chris Nerney

Imagine an entire culture of intelligent agents roaming the Internet and corporate intranets, working together to perform complex tasks such as updating investment portfolios, planning trips and even managing enterprise networks.

That is the vision of some researchers at Carnegie Mellon

See Agents, page 16

GTE chief's bold new plan



GTE Corp. hasn't exactly had the highest profile, but an ambitious CEO now wants to play with the big boys — and he is putting up the bucks to prove it. The company this year beefed up its Internet access and high-

speed data services by spending more than \$1 billion to buy BBN Corp. and purchase a fiber-optic network from Qwest Communications Corp. The deals significantly boosted the company's presence in the telecom and

See Lee, page 69



Download the complete transcript of our interview with GTE CEO Charles Lee.

www.nwfusion.com

**CAN YOU PLUG
ALL TYPES OF PEOPLE
INTO ONE TYPE
OF COMPUTER?**





No.

After all, people are different. Jobs are different. Companies are different. And people need different types of computers to get their jobs done. Some need powerful PC's and workstations. Some need light and powerful laptops. Some need hand-held devices. Some need simple terminals running off a network. And some need a combination of machines.

Computers *must* be different to meet the different demands people have in their jobs.

And the reason computers *can* be different is because Microsoft® Windows® is the same.

This benefits everyone in your organization. If you're the one actually using the computer, for example, Windows looks and acts the same familiar way wherever you see it, so you can move from one device to another without having to learn anything new.

If you're the one managing the computer system, the Windows platform makes your life automatically simpler; you can deploy different systems in different departments for different jobs and maintain them as if they're the same.

And if you're the one paying for the system, you spring for just as much computing power as you need for each employee. Not less, not more. And your employees end up with the tools they need to get their jobs done.

Windows is, above all, flexible.

So, let's rephrase the question. Can you plug all types of people into one operating system?

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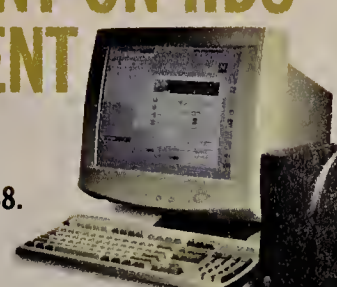


GIGABIT NETS TO THE RESCUE

Foundry's Bobby Johnson and others say Gigabit Ethernet could help ISPs improve 'Net performance. Page 31.


THE SKINNY ON HDS' THIN CLIENT

The NeoStation can access Windows, Java and other apps. Page 38.



WHAT'S A NOVONYX?

Robert Hicks, CEO of the Netscape-Novell joint venture, explains. Page 19.



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FOCUS

ATM in the LAN

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Be a NET KNOW-IT-ALL

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What popular Internet caching technology shares its name with a cephalopod?



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To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



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This Week

Only on Fusion

Internet. IANA's number isn't up yet. The government last week said it will provide at least six months' worth of funding for the Internet Assigned Numbers Authority so the group can continue to operate while it looks for private sources of money. **DocFinder: 2825**

Web sites. Unknown hackers have twice caused Microsoft's public Web site to grind to a halt in recent weeks. **DocFinder: 2826**

Hubs. 3Com last week unveiled plans to embed Web servers in hubs and switches. **DocFinder: 2827.**

800 service. The FCC set up rules that would have forced many carriers to compensate pay-phone owners for coinless toll-free calls. But an appeals court last week partially overruled the FCC. **DocFinder: 2828**

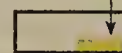
From the front page:

Secret Agent Man? Read our story about research into collaborative agents on the Internet, then come online for more info. You'll find links to overviews of other agent projects and a Java tool kit for building your own agents. **DocFinder: 2823**

HDSL. On page 1, we look at whether a new twist to this copper-based technology will cut T-1 costs. Link to Fusion for basic primers and DSL news. **DocFinder: 2822**

HOW TO GET ON TO NETWORK WORLD FUSION

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REVIEW: *Entrust Technologies takes top honors in our lab test of five encryption tools.* Page 53.

News briefs, July 7, 1997

The Web phone booth has arrived

■ NCR Corp. this week will introduce a Web-based electronic commerce kiosk the company claims will provide users with IP voice service, Web data access and a touch screen for Internet transaction services. The kiosk also has a smart card reader for credit cards and a digital certificate authentication service. Its applications can be managed remotely, NCR said. Though primarily targeted at telecommunications providers as next-generation public phones, NCR said the Web kiosk also can be used in a corporate setting to provide employees with information.

**UUNET gets into the fax**

■ UUNET Technologies, a WorldCom, Inc. subsidiary, is expected this week to announce international Internet fax service. The Fairfax, Va.-based Internet service provider also is expected to reveal that it will be using Open Port Technology, Inc.'s Harmony fax technology to support its new IP faxing service, said Rebecca Wetzel, director of Internet Services at TeleChoice, Inc. in Verona, N.J. The Chicago-based Open Port has been working with UUNET's parent, WorldCom, since last September. UUNET will not be the first ISP to offer global faxing. Last December, PSINet, Inc. announced its InternetPaper service, which is based on NetCentric Corp.'s FaxStorm IP fax sever technology.

Database access, Java style

■ Intersolv, Inc., of Rockville, Md., is now shipping a Java version of its DataDirect SequeLink communications software. The software includes a Java Database Connectivity driver that runs in any Java-based application, such as a Java Web browser. The driver connects the client to the multithreaded SequeLink server, which uses high-performance interfaces to pass the request to one or more networked databases. This approach bypasses the Web server in favor of a faster connection to data servers. Pricing starts at \$1,999 for five concurrent users working with a Microsoft SQL Server database. Other databases supported are: Sybase, Inc.'s System I0 and System I1; Oracle; Informix OnLine Dynamic Server; DB2; and OpenIngres.

© Intersolv: (301) 838-5000

BBN takes an I-Pass

■ As expected, BBN Planet, a subsidiary of BBN Corp., this month will announce that it is an I-Pass alliance member, said Patrick Kloepper, service line manager for remote access solutions at BBN Planet (NW, May 26, page 8). I-Pass is a consortium of Internet service providers that offers international Internet access. By becoming a member, BBN Planet Internet access customers will be able to roam globally using I-Pass' international local dial access network. BBN Planet is still working with Equant International Corp., its European partner, to build out its network internationally, but Kloepper said that network is designed for users that require high security. Dial-in users that need to access their corporate intranet while overseas will be advised to use the Equant network. Users that simply want to surf the Web while abroad will be advised to use the I-Pass network, he said.

IBM takes the low road

■ IBM last week beefed up the low end of its LAN hub and switching lines. The company rolled out a seven-slot version of its 8260 Multiprotocol Switching hub that can support 140 Ethernet or 126 Token Ring LAN users. The 8260 also got a 24-port switched 10Base-T Ethernet module. For its 8274 LAN switch, IBM added a 12-port 10/100 Ethernet switching module, a 32-port 10Base-T module and an eight-port 10Base-FX. The 8260 products are available now for \$3,700. The 8274 products will be available July 15 for \$5,440, \$5,590 and \$7,950, respectively.

White House backs global Internet free trade in electronic commerce report

While applauding government action, industry dissents over encryption policy.

By Ellen Messmer

The Clinton administration last week announced the government is backing an Internet free-trade policy intended to spur global electronic commerce.

Here and abroad, the government will advocate a "hands-off" approach to Internet regulation so online commerce and new technologies, such as digital cash, can flourish free from new taxes or rules that might stifle use.

"There are almost no international agreements about Internet commerce," said President Bill Clinton, who added the U.S. will advocate making the Internet a "tariff-free environment" when used to deliver products or services. The policies are strikingly similar to those advocated in a *Network World* cover story (NW, March 31, page 1).

The president's policy, described in a report entitled "A Framework for Global Electronic Commerce," calls for the Departments of Treasury and Commerce and other U.S. agencies to seek global consensus at the World Trade Organization and elsewhere before nations impose tariffs on Internet trade.

President Clinton said his administration this week will be presenting its vision of electronic commerce to the European Commission and European trading partners.

The administration's announcement, made during a ceremony in the White House East Wing packed with network industry CEOs and Internet illuminati, has generally won industry plaudits.

The new policy is evidence of "government and industry working together," said IBM CEO Lou Gerstner, sharing the spotlight with the president during the star-studded White House event.

Unpopular items

However, the administration's electronic commerce report — authored primarily by presidential advisor Ira Magaziner in coordination with several federal agencies — does contain a few unpopular items. For one, the report advocates continued control over the export of products with encryption and support for what is known as "key recovery."

In key recovery systems, a backdoor is built into products so law enforcement can decrypt user data by obtaining the key from a third-party holding firm.

"This is the only technically incorrect component of the report," said John Gage, Sun Microsystems, Inc. chief technol-

ogy officer, who called such key recovery systems inherently insecure. That same dissenting view was reiterated by 13 network industry CEOs, including Intel Corp. honcho Andy Grove and Microsoft Corp.'s Bill Gates, who together last week signed a statement generally endorsing the White House electronic commerce report.

In another area of keen interest to the Clinton administration — protecting consumer privacy on the Internet — the White House said in the report it wants online merchants to establish privacy policies that inform consumers how personal or purchasing information collected via the Internet will be used (see story, page 35).

In addition, the White House wants online service providers not to collect data from children unless their parents consent.

"We want to protect the individual by preserving individual privacy," said Vice President Al Gore.

If online merchants do not embrace the privacy protection suggestions in the report, the White House is prepared to push for regulations in this area. ■



The government may have to intervene if online merchants fail to protect privacy, says Vice President Gore.

QUICK TAKE: INTRANET SERVER IN A BOX

Microtest launches Web server appliance

Microtest, Inc. today will announce a hardware/software product, called WebZerver, designed to let users set up an intranet in 15 minutes or less.

All users need is a 10Base-T or 100Base-TX network connection, TCP/IP support and Web browsers to get an intranet up and running, according to Microtest officials. The rest comes in the WebZerver box.

WebZerver permits 50 connections per second. Wizards help users set up the intranet, and the software automatically senses the kind of network on which it is running.

"The software actively integrates itself into the network when you put it on, thereby lowering the actual deployment costs," said Tim Sloane, director of Internet research at Boston-based Aberdeen Group, Inc.

An EasyPrint client-side feature lets users post documents to the intranet simply by hitting a print button, so they do not have to worry about using HTML tools or File Transfer Protocol.

Other features include an EasyTalk discussion group tool and context-sensitive search capabilities.

WebZerver, due in August, sells for \$1,595. A beta version is available now for testing. Microsoft Corp.'s Internet Explorer Web browser ships with the product, but any standard browser can be used.

Microtest: (602) 952-6400



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SBC challenges constitutionality of telecommunications act

By Torsten Busse

SBC Communications, Inc. last week filed a lawsuit in federal court in an attempt to declare parts of the Telecommunications Act of 1996 unconstitutional.

SBC said the 1996 landmark reform "improperly discriminates against SBC and the remaining five Bell Operating Companies by imposing restrictions" that prohibit the them from competing for long-dis-

tance and other services that other local carriers are free to provide.

SBC, which owns Southwestern Bell Corp., Pacific Bell, Nevada Bell and the wireless operator Cellular One, filed its lawsuit in the U.S. District Court for the Northern District of Texas.

"The sole objective of this lawsuit is to increase competition by permitting SBC and the other RBOCs to provide long-distance and other services,"

said William Dreyer, SBC senior executive vice president, in a prepared statement.

The RBOCs had been barred from offering long-distance in their own service areas since the breakup of AT&T in 1984. But under the 1996 telecom reform act, local carriers that have opened their service areas to competition also may offer long-distance service.

However, two weeks ago the Federal Communications Commission said SBC had not done enough to open its local market to rivals in Oklahoma and barred the company from offering long-distance services in that area.

"The suit challenges only that portion of the act that singles out and excludes SBC from competing in certain lines of business.

SBC is not challenging those portions of the act which require all local exchange companies, including SBC, to open their local networks to competition," Dreyer said.

"This lawsuit has a narrow goal. We don't want to impose greater burdens or restrictions on anyone else. We are looking for the same opportunity to serve our customers as everyone else has and no more," Dreyer said.

SBC said it is challenging the telecom act's "Special Provisions Concerning Bell Operating Companies," which explicitly singles out the RBOCs by name. SBC contends that these provisions violate the Constitution's separation of powers and the company's freedom of speech.

The lawsuit was immediately attacked by SBC's competitors, including MCI Communications Corp.

"It is absurd that SBC is challenging the constitutionality of a law that gives consumers the freedom to choose," said Jonathan Sallet, MCI's chief policy counsel.

"The Bill of Rights does not give monopolies the right to gouge consumers. We trust the federal court will recognize this action for what it is: a desperate attempt by an entrenched local monopoly to avoid opening its local telephone market to competition," Sallet added.

Busse is a correspondent with the IDG News Service's San Francisco bureau.

Compaq serves up net gear

Highlights include 10/100 autosensing hub, 56K modems.

By Jodi Cohen

Houston

Hoping to mirror its success in the PC world, Compaq Computer Corp. is pushing hard to make a name for itself in the network arena.

To that end, the company last week bolstered its Netelligent line of network gear with myriad

while moving to a 100M bit/sec hub," she said.

Silva pointed out that competitor Intel Corp. allows customers to mix Ethernet and Fast Ethernet hubs within a stack, but can only do so on a per-box — not per-port — level.

Among the other announcements from Compaq:

COMPAQ SERVES UP ETHERNET HUB AND SWITCH MIX

Product name	Description	Price	Availability
Netelligent 2724	24-port dual-speed unmanaged hub	\$2,541	Q3
Netelligent 2824	24-port dual-speed managed hub	\$4,320	Q3
Netelligent 1005	5-port 10Base-T unmanaged hub	\$83	Now
Netelligent 1009B	8-port 10Base-T unmanaged hub	\$129	Q3
Netelligent 1017A/B	16-port 10Base-T unmanaged hub	\$256	Now
Netelligent 5708	8-port autosensing Ethernet switch	\$2,392	Q3
Netelligent 5226	24-port Ethernet switch with two Fast Ethernet uplinks	\$2,340	Q3

products, including hubs, switches, routing software and modems.

The highlight of the announcement was the introduction of the industry's first 10M/100M bit/sec Ethernet autosensing hub, according to one analyst.

"Compaq's hub autosenses the client and can run at either 10M or 100M bit/sec on a per-port basis," said Esmerelda Silva, an analyst at International Data Corp., a market research firm in Framingham, Mass. "That will be attractive to some customers who still want to support some of their 10M bit/sec clients

• The company's first 56K bit/sec modems, including a fax and PC card modem

• A family of Netelligent 10Base-T workgroup Ethernet hubs

• Two dual-speed Ethernet/Fast Ethernet switches

• Enhancements to the Netelligent 8500 router software, including NetWare Link Services Protocol support and IP firewall capability that allows it to serve as an Internet gateway

• Compaq Netelligent Management Software 2.0, which provides improved mapping capabilities

© Compaq: (713) 370-0670

Start-up offers tool for managing Web apps

By John Cox

San Francisco

Enabling Webmasters to manage the life cycle of Web-based applications is the idea behind new software from start-up Eventus Software, Inc.

The company is about to start beta tests of its Control Web management application designed to help users monitor the development and track usage of Web-based applications.

Control is a set of Windows 95- or NT-based management programs. It includes a link manager to monitor Web links, a deployment manager that copies application components to various Web servers and an activity monitor that tracks the application's usage and behavior.

The programs work with information stored in two Control repositories.

The programs access the information via standard interfaces such as Open Database Connectivity, File Transfer Protocol and HTTP.

One repository, essentially a file server, is the Source Control Server, which stores application components, such as HTML pages, embedded scripts and Common Gateway Interface (CGI) programs.

The other repository, running atop standard relational databases, contains information, called meta-data, about the various components. Metadata are such things as event log files or notices about when HTML pages

were last changed, by who and so on.

Control's programs also can work with third-party management systems, such as Intersolv, Inc.'s PVCS, an application for managing changes to and new versions of software applications.

Control's programs manage a range of tasks for developers and

condition (see graphic).

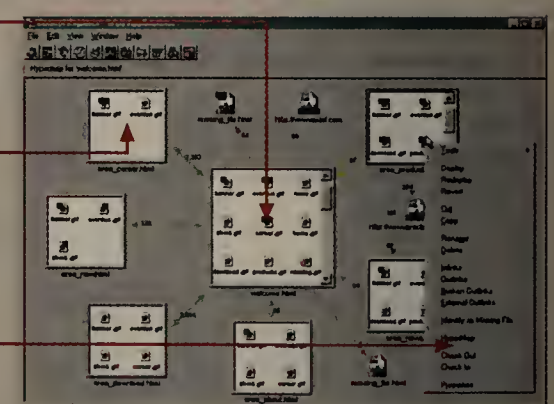
Once the application passes final testing, Control has programs to gather the components together and securely distribute them to the Web servers.

Control requires Windows 95 or NT, an Intel Corp. 486 PC with 10M bytes of disk storage and at least 16M bytes of memory. It has

GETTING WEB APPLICATIONS UNDER CONTROL

Eventus' Control Web application management suite can show all the links associated with a Web page and information about them.

- 1 A display of all components making up a Web page and their associated links.
- 2 Arrow colors and width, as well as numbers, show if a Web page link is working and how often it is used.
- 3 A list of options for troubleshooting links.



Webmasters. For example, in order to manage Web application development, Control has a simple check in/check out mechanism to track who is working on what code.

Another program, called the Component Manager, has a set of easy-to-use wizards to import CGI scripts, Web pages and graphics into the Source Control Server.

Still another program, the Link Manager, displays all the hypertext links and checks their

an embedded database or works initially with the Oracle Corp. database.

Eventus will support databases from Informix Software, Inc. and Sybase, Inc. in the future.

The product is expected to be released by year-end. The price is \$2,500 to \$10,000 for each server Control is monitoring and \$500 for each Webmaster or developer using the Control programs.

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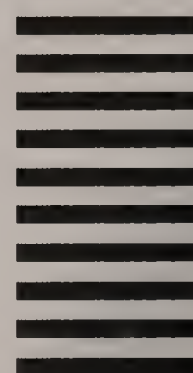
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UUNET takes another hit

By Denise Pappalardo

Users of UUNET Technologies' services had barely recovered from the Internet service provider's network brownout three short weeks ago (NW, June 23, page 16), when they experienced more network downtime last week. This time, UUNET said software on its Cascade 9000 frame relay switches caused the network to time-out.

A "bug on the switch software" caused the switches to relay incorrect information about the net topology, which caused the switches to drop packets, said Alan Taffel, UUNET vice president of marketing and business development.

The problem affected the ISP's East Coast switching hubs. Cascade sent a software revision on Monday, he said. The revised software was deployed on the Washington, D.C. switch, which was the hardest hit. Once UUNET was confident about the software, it deployed the new code on 15 Cascade 9000 frame relay switches to stabilize the net, Taffel said.

Many users around the East Coast—including Motley Fool, a Web-based financial reporting

company in Alexandria, Va., and Network World, Inc. in Framingham, Mass.—were affected.

Motley Fool uses UUNET's Web hosting services. "For the past three weeks, we've been running into problems," said Dwight Gibbs, the company's chief technical "fool." "My patience is running out," he said.

Motley Fool's server currently is up for about 30 to 40 minutes and then down for 2 to 3 minutes, Gibbs said. The Web-based company has reported the problems but has been told on several occasions by UUNET that there does not seem to be any trouble.

Other than an e-mail sent to UUNET's customers from its network operating center stating that it has been having software trouble on its switches, the ISP has not offered Motley Fool any help in resolving its problem.

Last month, UUNET's network slowed down for several hours because of a memory problem with its Cisco 7500 routers. Cascade confirmed that it sent UUNET new software and a bug in the software caused the switch problem.

"UUNET has had a bad month," Taffel said. ■

Visigenic details Web object plan

By John Cox

San Mateo, Calif.

Visigenic Software, Inc. last week laid out plans for software that could make it easier to build Web applications from reusable pieces of code called objects.

Corporate developers embracing Java for building Web applications need to rethink applications and design them as collections of objects, given that Java itself is an object-oriented language.

Communications software from Visigenic and others is the glue that connects software objects over the network.

Visigenic plans to introduce a new version of its VisiBroker 3.0 object request broker later this year and will start adding services to it that will handle a range of complicated tasks that otherwise have to be written by hand.

Corporate developers can use VisiBroker to build HTML pages that feature embedded Java applets, which in turn can call the new services to authenticate users, coordinate transactions and access databases.

New services will include transaction management, a type of directory called a trader service, messaging and security.

Companies such as Oracle Corp. and Netscape Communications Corp. have licensed VisiBroker as the glue that holds together their most important new Internet and intranet products.

For example, the latest releases of Netscape's browser and Web server now include part of VisiBroker to handle communications between Java applets running in the browser and server-based objects.

Today VisiBroker includes two application services—one that handles naming/directories and the other for connecting events, such as changes to a database or a new order.

Also under development is a management application, due out with VisiBroker 3.0, for graphically administering VisiBroker and its various parts.

The new products will be introduced over the next three to 12 months. ■

Microsoft writes check for e-mail connectivity firm

LinkAge deal provides Exchange with new links.

By Carol Sliwa

Redmond, Wash.

Microsoft Corp. last week acquired Toronto-based LinkAge Software, Inc. to help Exchange Server mail users connect to other messaging systems and synchronize mail directories.

LinkAge already has been selling Microsoft-certified products that let Exchange users connect with IBM host-based messaging systems and LAN-based systems such as Lotus Development Corp.'s Notes and cc:Mail.

But Microsoft decided to buy LinkAge—for an undisclosed amount—to provide customers with a one-stop shop for that kind of connectivity.

What's next

Plans call for Microsoft to integrate LinkAge's technology into future versions of the Exchange Server line.

"Because the [LinkAge] products are already so tightly

President Bob Jull. "You should be thinking about being able to install our products as easily as you can install the Microsoft Mail connector, cc: Mail connector or SMTP connector from Exchange today," Jull said.

Support plans

At least one LinkAge customer, Steve Wild, a systems consultant for Toronto-based Canadian Imperial Bank of Commerce, is hoping Microsoft will continue to sell LinkAge's products separately from Exchange and also support third-party e-mail systems.

No decisions have been made yet, according to Microsoft officials. But the company plans to continue servicing and supporting LinkAge customers.

Even before the acquisition, Microsoft had a strong message for customers considering a move to Exchange from another e-mail system, said Tim Sloane, director of Internet research with Boston-based Aberdeen Group, Inc.

For instance, Microsoft offers utilities that let an administrator populate an Exchange directory with information taken from an existing cc:Mail directory.

"The problem is that doesn't address the realities of most complex customer environments where you have multiple e-mail systems, and you're going to roll out Exchange over a period of months or years or maybe you never even intend to replace some departments," he said. "When that was the situation, Microsoft didn't have its own solution."

Sloane said the Microsoft/LinkAge offering might be viewed as a response to Lotus' high-end SoftSwitch messaging connectivity offerings.

Microsoft is acquiring LinkAge's technology, as well as the

The Microsoft/LinkAge offering might be viewed as a response to Lotus' high-end SoftSwitch messaging connectivity offerings, said Tim Sloane, Aberdeen Group, Inc.

PROFILE: LINKAGE SOFTWARE, INC.

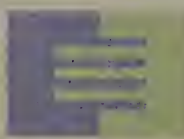
Headquarters: Toronto

Founded: In June 1985 by Bob Jull and Pat Gleeson

Primary products: LinkAge Message Exchange and LinkAge Directory Exchange, software for e-mail connectivity and directory synchronization

Employees: 52

Finances: Privately held, received venture capital funding last year from Bank of Montreal Capital and VenGrowth Investment Fund



integrated with Exchange, we should be able to do that quite quickly," said David Malcolm, a Microsoft product manager. However, he declined to say specifically how the combined LinkAge/Microsoft technology will be packaged.

LinkAge's goal is for its technology to become an Exchange feature, said company CEO and

company's development team, which will move to Microsoft headquarters in Redmond, Wash. Service and support employees will stay in Toronto.

IDG News Service correspondent Torsten Busse contributed to this report.

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Global networks

Insurance firms band together for electronic commerce

By Ellen Messmer
London

Four global insurance companies last week launched an IP-based electronic commerce service that lets industry participants securely exchange e-mail, documents and images.

The founding members of the World Insurance Network (WIN) said electronic document exchange will be a critical survival tool for many insurance firms.

At the present time, much of the document exchange between insurance firms involves paper, and the companies said that just will not cut it in an increasingly competitive era.

"WIN will reduce administrative costs and improve access to information," said Dennis Mahoney, deputy chairman and

CEO of The Aon Group, one of the founding companies. The other founders are J&H Marsh

and McLellan, Sedgwick and WillisCorroon.

The frame relay-based WIN



Insurance industry execs (left to right) Max Taylor (Willis Corroon), Peter Erskine (BT's National Business Communications), David Holbrook (Marsh McLennan), Ron Forrest and Dennis Mahoney (Aon) announced the World Insurance Network (WIN) for electronic commerce last week.

network will support the encrypted exchange of Lotus Notes and cc:Mail messages as well as Microsoft Mail messages by processing them through Control Data Corp. mail hubs set up by British Telecommunications plc and MCI Communications Corp.

Later, the network will support X.400 and Microsoft Exchange.

The insurance companies using WIN will digitally sign the electronic documents sent

across the network by means of digital certificates. "We will support legally binding contracts through digital signatures," Mahoney said.

David Evans, WIN president and CEO, said he hopes other insurance companies around the world will consider using WIN as their value-added network for electronic commerce.

WIN, which soon will have an office in New York, will charge insurance companies on a usage basis for access to their service. ■

3Com plans Web server in hub, switch for management ease

By Sari Kalin
Boston

3Com Corp. plans to embed Web servers into a workgroup hub and switch, making it easier for users to manage those devices.

The embedded Web server will let users install, configure, maintain and troubleshoot the devices over the World Wide Web via a browser, as well as get historical data on the devices' performance, according to officials.

Starting next month, Web server-enabled SmartAgent software will come standard with 3Com's SuperStack II PS Hub 40, officials said.

Users that already own such a hub will be able to get a software upgrade with the new feature. In September, the OfficeConnect Switch 140M, will be released and will include the Web-enabled SmartAgent software.

3Com plans to embed Web servers in future SuperStack hubs and OfficeConnect switches, a company spokesman said. Some of its existing products also will be upgradable with the Web capability, he said.

For a small office user that just wants to set up and configure an individual machine, a Web-based graphical user interface is much easier to use than the traditional ASCII terminal-based management systems, said Richard Villars, director of network software research at International Data Corp. in Framingham, Mass.

All the leading network hard-

ware vendors have unveiled similar Web-based management capabilities for their small office and remote office products, Villars said.

"Within two years, if you don't deliver a product geared for the small office that basically has a Web server built into it, it's not going to be acceptable in the market," Villars said.

3Com also offers Web-based network management applications, Transcend Access-Watch Software and Transcend dRMON Edge Monitor System, the 3Com spokesman said.

They enable a network manager to reach the management application via a Web browser, and the application uses SNMP to communicate with devices on the network, he said.

The OfficeConnect Switch 140M is a five-port, 10M/100M bit/sec managed switch, with an estimated price of \$1,000.

In other 3Com news, the company last week announced the 3Com Shopping Network, a Web site where customers and 3Com resellers can shop for network gear.

The site will include a tool called the 3Com Network Designer, which can help resellers and customers configure a proposed network and determine an optimal solution.

The site, initially created for resellers, is located at www.3com.com/3sn.

For more information, contact 3Com at (408) 764-5000.

Kalin is a correspondent with the IDG News Service in Boston.

Start-up puts 'premium' on Web searches

Northern Light bucks advertising-based revenue model for search engine firms.

By Chris Nerney
Cambridge, Mass.

A new Internet search engine company is betting users are willing to pay a few dollars for "premium" information usually not found on the World Wide Web.

Northern Light Technology LLC's search engine will feature a pay-per-view system under which Web browser users will pay \$1 to \$4 for specific documents retrieved from sources such as magazines, journals, databases and books.

"Our research says if we can give people information they really need at that particular point in time, they'll be more than willing to pay," said Northern Light CEO David Seuss. However, he said most information retrieved from the Web by the search engine will be free.

No ads allowed

Unlike most search engine companies, Northern Light does not plan to rely on advertising revenue, although Seuss would not discount generating some revenue from advertising down the road.

The company's search engine will organize infor-

mation by subject and source categories. The categories will be designed to allow users to quickly sift through thousands of hits to get the precise information they want. For example, a search on "intelligent agents" yields about 20,000 hits that are listed in groups of 25. Unlike AltaVista, which restricts access to the first 200 hits, Northern Light allows users to retrieve every hit reported.

On the left side of the search screen are related categories such as artificial intelligence,

commercial sites, job listings and conferences.

Click on "conferences," and more subcategories are listed, such as natural language processing, ontology and National Science Foundation.

The search engine's ability to categorize is based on clustering technology developed for databases, Seuss said.

Starting up

Northern Light was founded in January 1996 by Mark Sprague, the company's vice president of product development. Sprague and Seuss previously were executives at Spinnaker Software Corp.

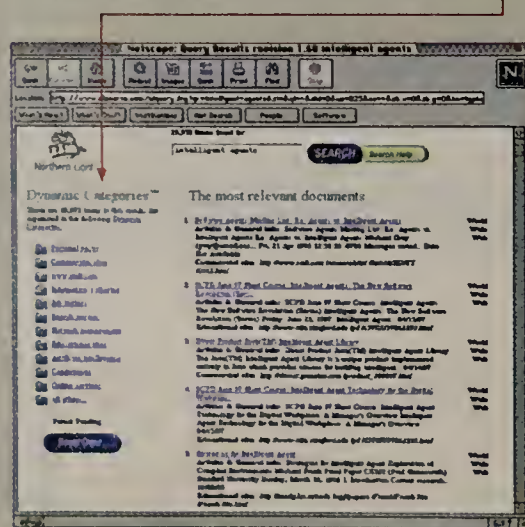
Northern Light received \$3.9 million in funding last year from Dataware Technologies, Inc. in Cambridge, Mass., and \$5.1 million last April from Bay Resource, a group of private investors also based in Cambridge.

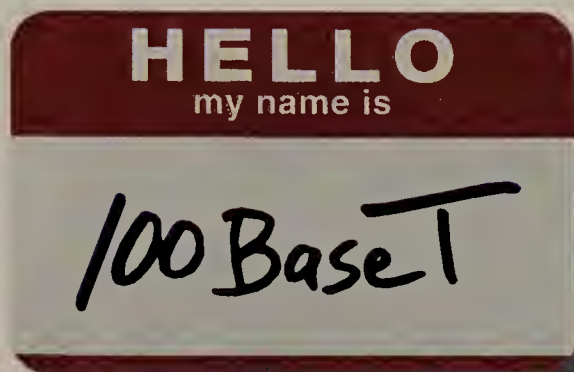
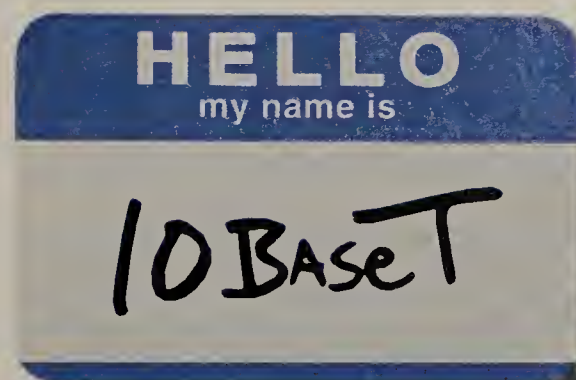
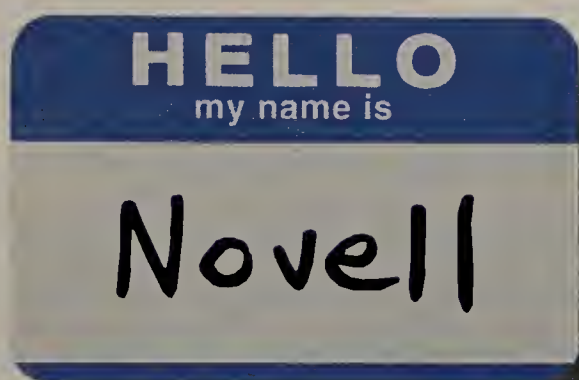
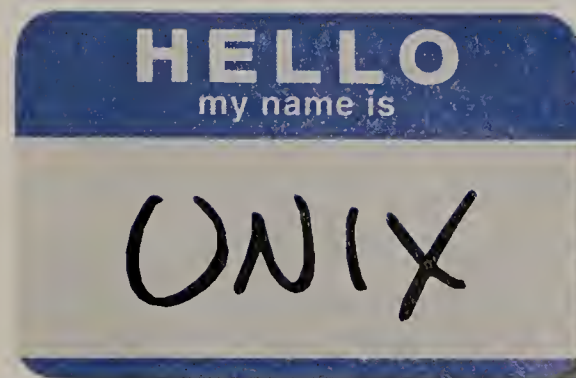
Northern Light will open its Web search site (www.nlsearch.com) to the public Aug. 5. The premium source information will be free for a two-week public beta period.

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Creating categories

Northern Light's search engine organizes information it retrieves into subject and source categories, making it easier for users to find precisely what they need.





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Agents

Continued from page 1

University in Pittsburgh who say they have developed and are running a prototype system featuring specialized software agents that communicate and interact on behalf of their human masters.

Intelligent agents already exist in cyberspace, but they gen-

tasks on a contractual basis. The idea is much like how a general contractor building a house lines up plumbers, electricians and other specialists.

Carnegie Mellon's project on multiagent and advanced agent systems is one of dozens currently underway in the U.S., Europe and elsewhere around the globe. Other research centers in the U.S. include the MIT Media Lab in Cambridge, Mass.

1980s, said Van Parunak, a researcher at the Industrial Technology Institute.

"One objective of AI was to create a computer program that approximates the intelligence of a human," he said. While that objective was not reached, "a lot of good stuff was done, and expert systems are a routine commodity now."

Parunak said complex agent systems already are used widely in the industrial world.

"IBM is using agents to make semiconductor chips in Burlington, Vt., and the Odense Steel Shipyard in Denmark is using agents to weld ship holes," he said. "An agent system runs the operator interface for the Shinkansen bullet train in Japan."

Much of the funding for agent research in the U.S. comes from the government and military. Carnegie Mellon's research on task-based coordination of intelligent agents began in 1994 with grants from the Department of Defense's Advanced Research Projects Agency and the National Science Foundation.

Sycara said the goal of the project is "to develop an infrastructure, sort of like an agent operating system." Carnegie Mellon agents are programmed using Java, Sycara said. The university project is using a Sun Ultra platform to run the software. But because the agents are written in Java and communicate using TCP/IP, "they can run anywhere," she said.

Anandee Pannu, manager of the Carnegie Mellon intelligent agent project, said enabling agents to find one another in cyberspace is simply a matter of creating agents that act as coordinators or clearinghouses, com-

piling databases of other agents available in cyberspace and the functions they perform.

"They would keep information about other agents," he said. Users could develop their own agent clearinghouses online or contact a well-known third-party clearinghouse.

Pannu said Carnegie Mellon's agent research team has not begun considering how to introduce the technology into the commercial world. Nonetheless, he said, there are two possible scenarios.

"A company could license the technology, or a business could spin off from the Carnegie Mellon group," he said.

But there still are obstacles to the widespread deployment of multiagent teams on the 'Net,

Sycara said. Standards must be agreed upon to allow agents created by different developers to work together. In addition, millions of agents interacting and running around cyberspace raises concerns about adequate bandwidth.

"The difficult problems remain difficult," she said.

"I don't know how soon we're going to get to the point where you can tell an agent exactly what you want and it will go out and get it done," he said. "That's going to require solving the artificial intelligence problem, and we haven't solved that yet," Parunak said. ■

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ALREADY ON THE JOB

Intelligent agents available to Internet and intranet users:

Desktop agents

- Operating system Assist users with desktop operating system
- Application Help users with a specific application
- Application suite Help users deal with a suite of applications

Internet agents

- Search Provide search services to users
- Filtering Filter things such as e-mail
- Information retrieval Agents behind push technology
- Mobile Travel from place to place to execute user-requested tasks

Intranet agents

- Process automation Automate business workflow processes
- Database Provide agent services for enterprise database users

SOURCE: AGENT SOURCEBOOK, WILEY COMPUTER PUBLISHING, JUNE 1997

erally work in isolation and perform singular, relatively simple tasks such as filtering e-mail and retrieving information on a scheduled basis (see graphic).

The new agents work as a team. Each type of agent is designed to carry out a specific function, according to project coordinator Katia Sycara, an associate professor at the Carnegie Mellon School of Computer Science's Robotics Institute (see story, right).

Sycara also envisions agents being able to find other agents in cyberspace to perform specific

and the Industrial Technology Institute in Ann Arbor, Mich.

Intelligent agents are software programs designed to automatically collect specific types of information on the Internet or perform other services, such as filtering out or organizing data. Basically, agent software performs tasks as delegated by users. Depending on the specific agent, they can be located on Web servers, enterprise networks or desktops.

Agent research is an outgrowth of artificial intelligence (AI) research conducted in the

Carnegie Mellon's world of agents

There are three types of agents used in the Carnegie Mellon University project. "Interface agents" interact with users to learn their preferences. This agent essentially acts as the chief of staff for the user, conveying instructions to "task agents" and "information agents."

Task agents learn how to plan specific activities. A task agent for coordinating trips "would know how to find airline tickets and locate hotels," said Katia Sycara, an associate professor at the Carnegie Mellon School of Computer Science's Robotics Institute. Information agents would then be instructed to go out and find the needed information.

One agent-based application, dubbed the "Warren" system (after megamillionaire Warren Buffet), employs a group of agents to retrieve information on the Web relevant to an individual's portfolio.

Another agent application being tested by some Carnegie Mellon professors, called the "Pleiades" system, uses agent teams to help users organize their schedules and increase productivity. Several agents were created for this application, including a "calendar apprentice" that learns users' scheduling preferences, a news reader that learns users' reading interests and a "visitor host," which helps schedule visitors for technical briefings.

—Chris Nerney

NC

Continued from page 1

He even said Oracle would help launch an NC-specific global ISP organization dubbed InterWorld. A year and a half after Ellison's pronouncement, InterWorld is nonexistent — and no one has picked up the ISP slack.

Eventually, NC deployment will be driven by specialized services from ISPs, but these will not roll out for 18 to 36 months, said Dan Taylor, industry analyst at Aberdeen Group, Inc., a Boston-based consulting firm.

Despite the rosy, long-term prospects, ISPs' current feelings about deploying databases that would store multiple applets —

ranging from simple Web browsing to the rental of a word processor — are lukewarm to downright cold.

Why? "We have yet to find more than a handful of customers talking about NCs," said Dave Hudson, vice president of business development at PSINet, Inc. "The concept has a lot of merit. But we haven't seen many of the Fortune 500 companies looking to jump into NC services."

Specialized NC services may be far off for most ISPs, but many could maintain NCs on a case-by-case basis if users demand it.

Early adopters are looking at NCs now, and those types of users generally do not look to their ISP for assistance, said

Pushpendra Mohita, executive vice president at TCG Cerfnet, a subsidiary of Teleport Communications Group. Hosting database servers in an intranet environment is probably the first phase, he said.

Another likely scenario is NC-based services that include Web browser support, PSINet's Hudson said. ISPs could bundle access to the browser with their data services, let customers do basic surfing and run whatever applets are out there.

But currently there is a shortage of NC-specific browsers. Corel Corp., one of many companies developing NCs, has said it is working with Netscape Communications Corp. to develop a Web browser specifically de-

signed for NCs. The thin-client browser based purely on Java is expected to be available by year-end and could heighten ISPs' interest in NCs.

The first NC-based ISP service will probably be simple bundling, said Robert Hagens, director of Internet engineering at MCI Communications Corp. While MCI does not have any NC-based services on its drawing board, an NC bundled with an ISDN or a 56K bit/sec dial access with 20 free hours might be a package in which users would be interested, he said.

"NCs are great; anything that adds more hosts to the Internet is a good thing," Hagens said. But the devices are just coming out, the technology is new and

advertisements are scarce, he said. Between the lack of demand and a clear business model for the ISPs, NC-based services will not be seen for quite some time, Taylor said.

Oracle defended its ISP efforts. The company is working with several ISPs and service providers around the world who are conducting NC trials, said Randy Brasche, marketing manager at NCI, a division of Oracle Corp. Brasche, however, could not name any of these companies. Announcements are expected between NC vendors and ISPs by year-end, he said. ■

Get more info online at www.nwfusion.com. DocFinder: 2824

Xylan multiplies LAN switch ports

By Jodi Cohen
Calabasas, Calif.

Users will soon be able to stuff Xylan Corp.'s OmniSwitch with three times as many Ethernet switch ports and six times as many switched Fast Ethernet segments than previously possible.

The LAN switch vendor rolled out a pair of new modules, including a higher port density Ethernet card and the company's first Fast Ethernet switch. The new 32-port Ethernet module slides into the OmniSwitch chassis to provide a maximum of 256 switched 10M bit/sec ports in a single box.

Previously, customers could only load the eight-slot chassis with 12-port modules, providing a maximum of 96 Ethernet ports.

And cramming more ports onto a board is important to at least one Xylan customer.

"Right now, we can only use the Xylan switches on our backbone because of the limited number of Ethernet ports. But we'll start pushing those out into workgroups because of the higher port density," said Nezille Teagarden, manager of technology architecture at Janus, a mutual fund company in Denver.

XYLAN'S SWITCHING ROAD MAP

Product	Availability
● Gigabit Ethernet one-port uplink module	Q3
● Four-port Gigabit Ethernet switch module	Q4
● 32-port autosensing 10M/100M bit/sec Ethernet switch module	Q4

*All modules slide into Xylan's OmniSwitch chassis.

Xylan also rolled out a 12-port Fast Ethernet switch module that provides as many as 96 switched 100M bit/sec ports in a fully loaded OmniSwitch chassis.

The company's previous Fast Ethernet offering was an eight-port Fast Ethernet repeater module that provided only two switch segments.

Now customers can deploy a full-blown Fast Ethernet switch that offers eight separate 100M bit/sec Ethernet switch segments.

"That means our LAN switch is now dense enough to replace almost any hub," said Douglas Hill, vice president of corporate communications at Xylan.

Both modules are based on Xylan's new Mammoth and Whistler Application Specific Integrated Circuits, which provide more than 2G bit/sec of internal switching throughput and dynamic buffering.

The Ethernet switch module is priced at \$185 per port, and the Fast Ethernet switch card costs \$455 per port.

Gearing up for Gigabit

In addition, Xylan laid out its plan for providing Gigabit Ethernet gear.

Xylan will ship a four-port, full-duplex 1G bit/sec Ethernet switch module for

its OmniSwitch chassis by year-end.

Although the chassis could be fully loaded with as many as 32 Gigabit Ethernet ports, the box's backplane capacity is only 11.5G bit/sec, so the switch would be oversubscribed with anything over 11 links, Hill said.

Hill also pointed out that customers will be able to move token-ring traffic

across the Gigabit Ethernet backplane, giving Big Blue customers a high-speed migration port.

In addition, the company will roll out a one-port Gigabit Ethernet uplink module for the OmniSwitch, as well as the workgroup PizzaSwitch in the third quarter.

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Local Networks

Covering: LAN Hubs, Switches, and Management • Operating Systems • Servers

Briefs

■ **Boffin, Ltd.** in Burnsville, Minn., has announced a new family of servers based on Sun Microsystems, Inc.'s **SPARCengine Ultra AX** motherboard.

The product line includes CD-

ROM, Web, video, firewall and remote access servers.

Each base configuration includes an Ultra AX



board with an UltraSPARC I 167-MHz CPU, 64M bytes of RAM, a 2.5G-byte hard drive, a video card with 2M bytes of RAM, an 8x CD-ROM and Solaris 2.X.

Pricing starts at \$9,797.

© Boffin: (612) 894-0595

■ **LANart Corp.**, a Needham, Mass.-based **switching hub vendor**, has received \$2 million in additional venture capital funding.

The funding will be used to increase sales and marketing support as well as to invest in product development, said Howard Yenke, LANart president and CEO.

Companies that are providing funding include Hancock Venture Partners, Charles River Venture Partners, Allstate Venture Capital and Sigma Partners.

■ **Data General Corp. (DG)** has announced **SecureLine**, turnkey hardware and software packages that include **Avilion** servers and **Clariion** storage products bundled with various third-party **security software** offerings.

Security software vendors partnering with DG include **BDM International, Inc.**, **CyberGuard Corp.**, **Microsoft Corp.** and **Raptor Systems, Inc.**

The **SecureLine** offerings run on **Unix** and **Windows NT**.

Pricing varies depending on the combination of hardware and software.

Novonyx CEO: Venture will foster choice

Hicks downplays concerns that the joint venture between Novell and Netscape will compete with Novell services.



In March, Novell, Inc. and Netscape Communications Corp. announced their intention to form a separate and independent company called Novonyx, Inc. to port Netscape's suite of 'Net products to IntranetWare.

However, since that time, the industry has questioned how Novell could partially fund and provide an entire executive staff for and open up its sales and distribution infrastructure to a company that will effectively ship products that will compete with all of Novell's Web and groupware services.

Network World Senior Writer Christine Burns recently spoke with appointed Novonyx CEO Robert Hicks about his plans to compete and cooperate with the new Utah-based venture.

How big is Novonyx, and how fast do you expect it to grow?

We have 12 employees and expect to grow to 70 by year-end. We will evaluate any engineers laid off from Novell case by case to see if we want to pick them up.

In light of the recent troubles at Novell concerning top-heavy management, what will your approach to the Novonyx management team be?

The management team will be very small. We are going to run this thing almost as if it were a start-up. We will not have a lot of overhead people. We will have mostly engineers.

Will you release Netscape products as a suite or one at a time?

We would love to be able to release them all at once as a suite. However, we can't do that without extending the [delivery schedule] window quite a bit.

What are the targeted server?

Customers tell us they want the Web, messaging and proxy servers. And customers are very interested in directory services because they tie those things together.

"What we are about is offering greater freedom of choice as well as more products for IntranetWare customers."

Robert Hicks, CEO, Novonyx



Will Novonyx products be sold through the Novell channel?

We hope to use both [Novell and Netscape] channels, but the primary one at the beginning will be Novell's. Both Novell's sales and education channels are enormous opportunities for Novonyx. The Netscape channels are less well defined but are growing.

When are you shooting to release products?

We are on track for making the Enterprise 3.0 [publishing and document management server] and FastTrack [Web] servers available in the fall.

All of those areas are already covered by Novell on IntranetWare. How are you going to resolve competition in the channel between what Novell and Novonyx offer?

We have set up a separate company that is independent of Novell and Netscape. From that perspective, it is not the same company, and therefore, there is nothing to be resolved from a strategic standpoint.

What we are about is offering greater freedom of choice as well as more products for IntranetWare customers. I can't recall too many customers complain-

There's more online:

- The complete transcript of our interview with Novonyx CEO Robert Hicks
- An interview with Denise Gibson, head of Novell's Internet strategy

www.nwfusion.com



ing that there is more than one Web server or messaging solution available for NT. IntranetWare needs to drive to a similar model.

Novell Directory Services (NDS) is critical to IntranetWare, so how are you going to distinguish between a Lightweight Directory Access Protocol-based directory from Netscape and an LDAP-enabled version of NDS?

We want customers to be able to use in the Netscape environment what they are used to: LDAP client interfaces. At the same time, for those customers that have IntranetWare, they will have the ability to use NDS to manage it.

So a customer will be able to sit at a workstation and bring up the administration server from Netscape, and you won't know that you are also populating NDS. An IntranetWare administrator might use NWAdmin and be able to accomplish the same.

How do you see the Novonyx product set competing against Novell's BorderManager suite of firewall, proxy and virtual private networking services?

Customers can use the Netscape Web server and use BorderManager to pick up additional functionality that may not be available in the Netscape proxy server.

But if customers want to go with a lighter weight implementation and use the Netscape proxy server, they will be able to do that.

If they want to standardize on BorderManager, we will try to integrate the SuiteSpot servers for that environment. ■

NetFrame bolsters server line with Pentium Pro four-way model

By Sari Kalin
Milpitas, Calif.

NetFrame Systems, Inc. plans to add a four-way Pentium Pro server to its lineup, pitching the machine as a high-availability server for remote offices and small-to-midsize businesses.

With the NF9008 release, NetFrame is seeking to expand beyond its traditional market of data centers in large companies, said Hitesh Shah, senior product manager for the NF9008. The machine is aimed at customers that want scalability and features

such as hot-pluggable PCI technology but do not have the need or budget for rack-mounted systems, he said.

The NF9008 is shipping now and will be available in volume in the third quarter. It is priced starting at \$9,995 for a single Pentium Pro 200-MHz system with a 512K-byte cache, Shah said.

That pricing includes one power supply, eight individual hot-pluggable PCI card slots and eight hot-swappable, redundant fans. Memory, priced separately,

starts at \$995 for 64M bytes.

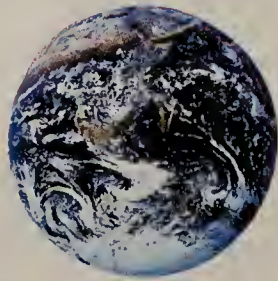
A two-way system with two power supplies, two Ethernet cards, two SCSI cards, six 9G-byte drives and 256M bytes of memory is priced under \$30,000, Shah said.

When the NF9008 runs Novell, Inc.'s IntranetWare, the PCI cards are hot-swappable and hot-addable, he said. When it runs Windows NT, the cards are only hot-swappable because that is all NT supports now, according to Shah. Microsoft Corp. will support the hot-addable capability in NT next year.

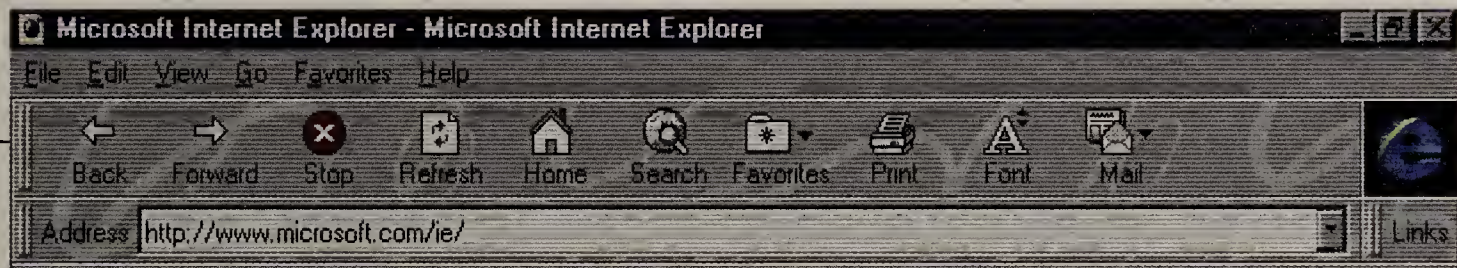
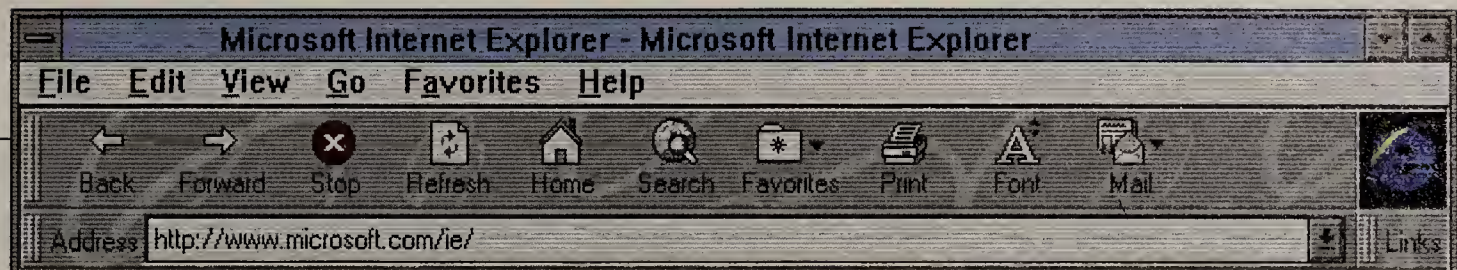
For information, contact NetFrame at (408) 474-1000.

Kalin is a correspondent with IDG News Service's Boston bureau.

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Network computers strike back

In the interest of fairness, I'm devoting my column this week to the network computer (NC).

Last week, I wrote about NetPCs and Windows Terminals, Microsoft's response to the NC movement spearheaded by

Oracle, Sun and others (NW, June 30, page 20). NCs are lightweight client computing devices that access centrally managed servers running Java applets and other applications.

The two NC items I want to look at are the release — finally — of an NC server operating system by Oracle and the roll-out of an NC client operating system from

Neoware (formerly HDS).

Oracle's Network Computers, Inc. subsidiary has released the NC OS, which Oracle is packaging under the NC Server label along with a database, video server, Webserver and more.

Is there any good reason to swap in all this Oracle software and toss out your Microsoft software?

Oracle would like you to think so and is even touting a flawed cost comparison between five-user NC and NT networks.

After overestimating the cost of the NT system and underestimating the cost of the NC system, Oracle has determined that the NC hardware and software combination costs 58% less!

Don't ask me what happened to the \$500 NC; this comparison shows them costing \$1,200 each.

By the way, Oracle said the NC OS also includes mechanisms for "initialization, authentication, file system and printing services for network computers."

As a network administrator, I cared a lot more about these services than I did about the applications being used.

But all Oracle is saying about these services is that they are "based on scalable industry standards and protocols," without any details.

Microsoft, over 10 years, has discovered how difficult it is to build a server operating system. In fact, Microsoft still doesn't have it completely right. I expect it may take at least as long for Oracle to succeed.

Moving on to Neoware, this early NC backer now appears to be hedging a bit.

Neoware is about to release an operating system, netOS, for its NCs that, in addition to adhering to the NC reference specification, also can act as a Windows Terminal by incorporating Citrix Systems' Independent Computing Architecture protocol.

Neoware's news is hardly a rousing endorsement of the NC. Getting right to the heart of the matter, Neoware Executive Vice President Michael Kantrowitz said, "The NC needs to run Java, but it has to do everything a PC can do, also."

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.



Dave Kearns



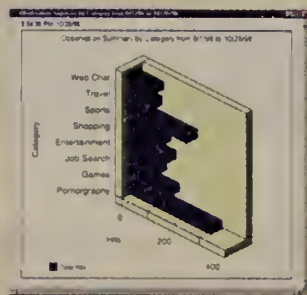
WHAT'S WRONG WITH THIS PICTURE?

What's wrong is that it appears "Joe Worker" is hard at work. But what's really going on is frivolous surfing.

The truth is 40-60% of Internet activity is spent in unproductive sites and all this "inactivity" is costing corporations thousands of dollars in lost productivity. Employees may look busy but the reality is they're spending too much time in non-business related sites.

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—PC Magazine

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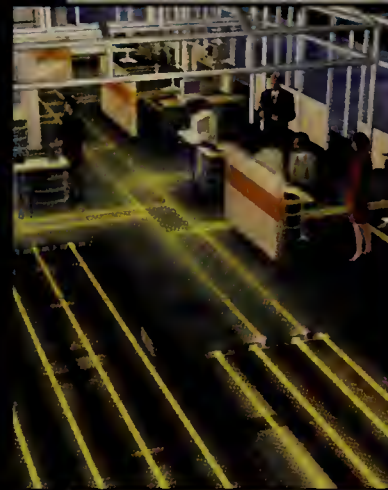
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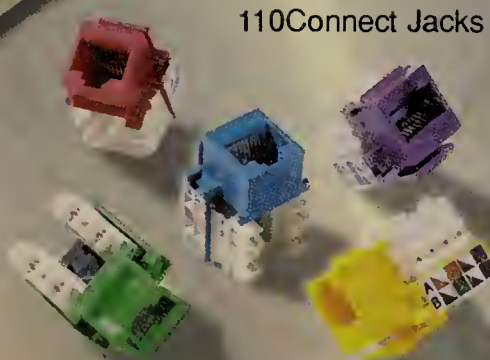
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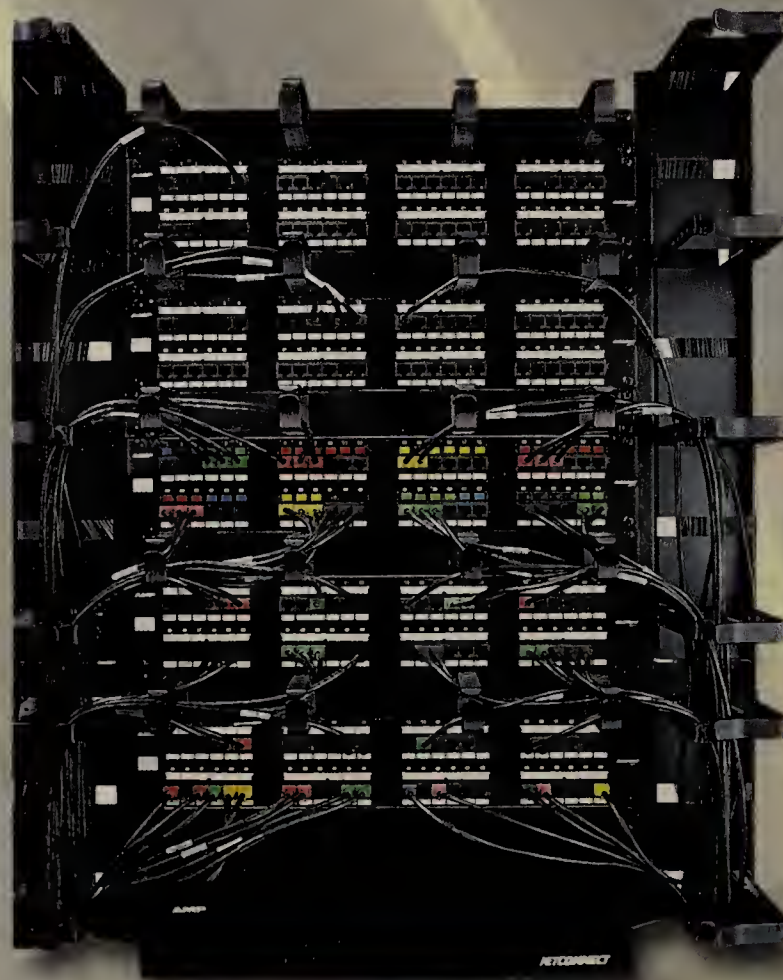


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What is the principal business activity at your location? (check one only)

- | | |
|--|--|
| 01. <input type="checkbox"/> Manufacturing (other) | 12. <input type="checkbox"/> Government (Federal/State/Local) |
| 02. <input type="checkbox"/> Finance/Banking | 13. <input type="checkbox"/> Military |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal | 14. <input type="checkbox"/> Aerospace |
| 04. <input type="checkbox"/> Health Care Services | 15. <input type="checkbox"/> Consulting (Independent)* |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation | 16. <input type="checkbox"/> Carriers/Interconnects |
| 06. <input type="checkbox"/> Media/TV/Cable/Radio/Print | 17. <input type="checkbox"/> Internet Service Provider (ISP) |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services | 18. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM) |
| 08. <input type="checkbox"/> Transportation | 19. <input type="checkbox"/> Resellers of Computer/Network Products (VARs, VADs) |
| 09. <input type="checkbox"/> Utilities | 20. <input type="checkbox"/> Systems/Network Integrators* |
| 10. <input type="checkbox"/> Education | 21. <input type="checkbox"/> Distributors (Computer/Communications)* |
| 11. <input type="checkbox"/> Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry) | 22. <input type="checkbox"/> Other (please specify) _____ |

*Please complete form based on largest client.

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

- | | |
|--|---|
| 1. <input type="checkbox"/> Network Management | 6. <input type="checkbox"/> Engineering Management |
| 2. <input type="checkbox"/> LAN Management | 7. <input type="checkbox"/> Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management) |
| 3. <input type="checkbox"/> Datacom/Telecom Management | 8. <input type="checkbox"/> Consultant (Independent) |
| 4. <input type="checkbox"/> IS, IT, MIS, CIO, Systems Management | 9. <input type="checkbox"/> Other (please specify) _____ |
| 5. <input type="checkbox"/> Intranet/Intranet Management/Webmaster | |

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

- | | | |
|-----------------------------------|---|--|
| 1. \$50 Million or more | A <input type="checkbox"/> Large Systems (Mainframes/Minis) | H <input type="checkbox"/> Internet |
| 2. \$25 Million to \$49.9 Million | B <input type="checkbox"/> Desktops (Micros/Laptops/Workstations) | I <input type="checkbox"/> Intranet |
| 3. \$10 to \$24.9 Million | C <input type="checkbox"/> Servers | J <input type="checkbox"/> Remote Access |
| 4. \$1 to \$9.9 Million | D <input type="checkbox"/> LANs | K <input type="checkbox"/> Peripherals |
| 5. \$100,000 to \$999,999 | E <input type="checkbox"/> WAN Equipment | L <input type="checkbox"/> Software |
| 6. \$50,000 to \$99,999 | F <input type="checkbox"/> Carrier Services | M <input type="checkbox"/> Service/Support |
| 7. Under \$50,000 | G <input type="checkbox"/> Internetworking | |
| 8. None of the above | | |

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
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<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

- | | | |
|--|---|--|
| A. Scope (check one only) | B. Involvement (check ALL that apply) | |
| 1. <input type="checkbox"/> Corporate/Enterprise | 1. <input type="checkbox"/> Create Network Strategy | 4. <input type="checkbox"/> Evaluate |
| 2. <input type="checkbox"/> Department | 2. <input type="checkbox"/> Recommend/Specify | 5. <input type="checkbox"/> Determine the need |
| 3. <input type="checkbox"/> None | 3. <input type="checkbox"/> Approve | 6. <input type="checkbox"/> None |

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

- | | |
|---|---|
| A. At your location: | B. Entire organization: |
| 1. <input type="checkbox"/> Over 20,000 | 1. <input type="checkbox"/> Over 20,000 |
| 2. <input type="checkbox"/> 10,000 - 19,999 | 2. <input type="checkbox"/> 10,000 - 19,999 |
| 3. <input type="checkbox"/> 5,000 - 9,999 | 3. <input type="checkbox"/> 5,000 - 9,999 |
| 4. <input type="checkbox"/> 2,500 - 4,999 | 4. <input type="checkbox"/> 2,500 - 4,999 |
| 5. <input type="checkbox"/> 1,000 - 2,499 | 5. <input type="checkbox"/> 1,000 - 2,499 |
| 6. <input type="checkbox"/> 500 - 999 | 6. <input type="checkbox"/> 500 - 999 |
| 7. <input type="checkbox"/> 499 or less | 7. <input type="checkbox"/> 499 or less |

8

Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

INTERNET/INTRANET

- A ☐ 01. ☐ Internet Services
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Internet Web Servers
☐ 04. ☐ Intranet Web Servers
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Push Technology
☐ 08. ☐ Web Browsers
☐ 09. ☐ Intranet Applications/Groupware
☐ 10. ☐ Search/Retrieval Products (web crawler)
☐ 11. ☐ Internet Development Tools (JAVA, ActiveX, etc.)
☐ 12. ☐ Electronic Commerce Tools
☐ 13. ☐ Internet Telephony

LOCAL-AREA NETWORKS

- A ☐ 14. ☐ Local-Area Networks
☐ 15. ☐ Network Operating System Software
☐ 16. ☐ Servers
☐ 17. ☐ Print Servers
☐ 18. ☐ ATM Switches
☐ 19. ☐ Token-Ring Switches
☐ 20. ☐ Ethernet Switches
☐ 21. ☐ Fast Ethernet
☐ 22. ☐ Gigabit Ethernet
☐ 23. ☐ IP Switches
☐ 24. ☐ LAN Storage/Backup
☐ 25. ☐ Optical LAN Storage/Backup
☐ 26. ☐ Disk LAN Storage/Backup
☐ 27. ☐ Tape LAN Storage/Backup
☐ 28. ☐ RAID LAN Storage/Backup
☐ 29. ☐ Network Test/Diagnostic Tools
☐ 30. ☐ Cables, Connectors, Baluns
☐ 31. ☐ UPS
☐ 32. ☐ Network Interface Cards
☐ 33. ☐ SNMP Network Management

INTERNETWORKING

- A ☐ 34. ☐ Routers
☐ 35. ☐ Hubs
☐ 36. ☐ Intelligent Hubs
☐ 37. ☐ Stackable Hubs
☐ 38. ☐ Bridge/Router
☐ 39. ☐ Bridges
☐ 40. ☐ Gateways
☐ 41. ☐ Concentrators/Repeaters

COMPUTERS/PERIPHERALS

- A ☐ 42. ☐ Network Computers
☐ 43. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 44. ☐ Micros/PCs
☐ 45. ☐ Minis
☐ 46. ☐ Mainframes
☐ 47. ☐ Workstations
☐ 48. ☐ Printers/Network Printers
☐ 49. ☐ CD-ROM
☐ 50. ☐ Fax/Modem Boards
☐ 51. ☐ Graphics/Multimedia/Audio/Video Boards
☐ 52. ☐ Memory/Chips/Boards/Cards

REMOTE/WIRELESS COMPUTING

- A ☐ 53. ☐ Remote Access Products
☐ 54. ☐ Remote Access Services
☐ 55. ☐ PDAs
☐ 56. ☐ PCMCIA Devices
☐ 57. ☐ Wireless Data Services
☐ 58. ☐ Wireless Data Equipment
☐ 59. ☐ Cellular Equipment & Services

SOFTWARE/APPLICATIONS

- A ☐ 60. ☐ Network Management
☐ 61. ☐ Systems Management
☐ 62. ☐ Security
☐ 63. ☐ Communications Software
☐ 64. ☐ Terminal Emulation
☐ 65. ☐ Operating Systems
☐ 66. ☐ Applications Development Tools
☐ 67. ☐ Database Management/RDBMS
☐ 68. ☐ Groupware
☐ 69. ☐ Workflow
☐ 70. ☐ EDI
☐ 71. ☐ E-mail
☐ 72. ☐ Desktop Video Conferencing
☐ 73. ☐ Imaging
☐ 74. ☐ Suites/Server Suites (Back Office, etc.)
☐ 75. ☐ Middleware
☐ 76. ☐ Document Management
☐ 77. ☐ Site Metering Tools
☐ 78. ☐ Computer Telephony Integration (CTI)
☐ 79. ☐ Data Warehousing

WIDE-AREA NETWORK EQUIPMENT & SERVICES

- A ☐ 80. ☐ Modems
☐ 81. ☐ Asynchronous Transfer Mode (ATM)
☐ 82. ☐ Frame Relay Equipment/Services
☐ 83. ☐ ISDN Equipment & Services
☐ 84. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 85. ☐ DSL Services/Products
☐ 86. ☐ SONET
☐ 87. ☐ Inverse Multiplexers
☐ 88. ☐ SMDS
☐ 89. ☐ Diagnostic/Test Equipment
☐ 90. ☐ DSU/CSU
☐ 91. ☐ VSAT/Satellite
☐ 92. ☐ PBXs
☐ 93. ☐ Voice Mail/Response
☐ 94. ☐ Videoconferencing
☐ 95. ☐ Leased Lines
☐ 96. ☐ Switched Data
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services
☐ 00. ☐ None of the above (1 - 99)

9

Please indicate the platforms that are currently installed/planned:

(Check ALL that apply)

A. Currently installed

B. Planned for purchase

NETWORK PROTOCOLS

- A ☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ DECnet
☐ 05. ☐ Novell IPX/SPX
☐ 06. ☐ APPC/APPN/LLU 6.2
☐ 07. ☐ NETBIOS
☐ 08. ☐ AppleTalk
☐ 09. ☐ NFS
☐ 10. ☐ Other (please specify) _____

LAN ENVIRONMENT

- A ☐ 11. ☐ Gigabit Ethernet
☐ 12. ☐ Switched Ethernet
☐ 13. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 14. ☐ Ethernet
☐ 15. ☐ ATM
☐ 16. ☐ Token Ring/Token Ring Switching
☐ 17. ☐ IP Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ LocalTalk
☐ 22. ☐ Fibre Channel
☐ 23. ☐ 100vg Any LAN
☐ 24. ☐ Other (please specify) _____

NETWORK OPERATING SYSTEM

- A ☐ 25. ☐ Windows NT
☐ 26. ☐ Windows NT/Advanced Server
☐ 27. ☐ Novell IntranetWare
☐ 28. ☐ Novell (NetWare 4.X)
☐ 29. ☐ Novell (NetWare 2.X, 3.X)
☐ 30. ☐ Microsoft (LAN Manager)
☐ 31. ☐ LocalTalk (AppleTalk)
☐ 32. ☐ Banyan (VINES)
☐ 33. ☐ IBM (LAN Server)
☐ 34. ☐ Artisoft (LANtastic)
☐ 35. ☐ Other (please specify) _____

COMPUTER OPERATING SYSTEM

- A ☐ 36. ☐ NT Server
☐ 37. ☐ NT Workstation
☐ 38. ☐ Unix/Xenix/AIX
☐ 39. ☐ Solaris
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ Windows 97
☐ 43. ☐ DOS
☐ 44. ☐ OS/2/OS/2 Warp
☐ 45. ☐ IBM MVS/VM/VSE
☐ 46. ☐ Digital VMS
☐ 47. ☐ Macintosh
☐ 48. ☐ Other (please specify) _____

☐ 49. ☐ None of the above (1-48)

10

Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

- | | A. Servers | B. Clients | | A. Servers | B. Clients |
|----------------------------|--------------------------|--------------------------|-----------|--------------------------|--------------------------|
| 01. Power PC | <input type="checkbox"/> | <input type="checkbox"/> | 07. 486 | <input type="checkbox"/> | <input type="checkbox"/> |
| 02. Power Mac | <input type="checkbox"/> | <input type="checkbox"/> | 08. 386 | <input type="checkbox"/> | <input type="checkbox"/> |
| 03. Mac Other | <input type="checkbox"/> | <input type="checkbox"/> | 09. 286 | <input type="checkbox"/> | <input type="checkbox"/> |
| 04. Multiprocessor Servers | <input type="checkbox"/> | <input type="checkbox"/> | 10. Risc | <input type="checkbox"/> | <input type="checkbox"/> |
| 05. P6/P11 | <input type="checkbox"/> | <input type="checkbox"/> | 11. Alpha | <input type="checkbox"/> | <input type="checkbox"/> |
| 06. Pentium/Pentium Pro | <input type="checkbox"/> | <input type="checkbox"/> | 12. Other | <input type="checkbox"/> | <input type="checkbox"/> |

11

Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

- | A - Mainframes (Large Scale)
Installed/Planned | B - Minis (Midrange)
Installed/Planned | C - Workstations
Installed/Planned |
|---|---|--|
| 1. <input type="checkbox"/> IBM | 1. <input type="checkbox"/> IBM RS6000 | 1. <input type="checkbox"/> Sun Microsystems |
| 2. <input type="checkbox"/> Amdahl | 2. <input type="checkbox"/> IBM AS400 | 2. <input type="checkbox"/> Silicon Graphics |
| 3. <input type="checkbox"/> Cray | 3. <input type="checkbox"/> Digital | 3. <input type="checkbox"/> Digital |
| 4. <input type="checkbox"/> Hitachi | 4. <input type="checkbox"/> Tandem | 4. <input type="checkbox"/> HP |
| 5. <input type="checkbox"/> Unisys | 5. <input type="checkbox"/> Unisys | 5. <input type="checkbox"/> IBM |
| 6. <input type="checkbox"/> Other _____ | 6. <input type="checkbox"/> AT&T GIS | 6. <input type="checkbox"/> Other _____ |
| | 7. <input type="checkbox"/> H-P | |
| | 8. <input type="checkbox"/> Data General | |
| | 9. <input type="checkbox"/> Other _____ | |

12

What is the estimated gross annual revenue of your entire company/institution? (check one only)

- | | | |
|---|---|---|
| 01. <input type="checkbox"/> \$20 billion or more | 05. <input type="checkbox"/> \$100 million to \$499.9 million | 08. <input type="checkbox"/> \$5 million to \$9.9 million |
| 02. <input type="checkbox"/> \$10 billion to \$19.9 billion | 06. <input type="checkbox"/> \$50 million to \$99.9 million | 09. <input type="checkbox"/> \$4.9 million or less |
| 03. <input type="checkbox"/> \$1 billion to \$9.9 billion | 07. <input type="checkbox"/> \$10 million to \$49.9 million | 10. <input type="checkbox"/> None of the above |
| 04. <input type="checkbox"/> \$500 million to \$999.9 million | | |

13

For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

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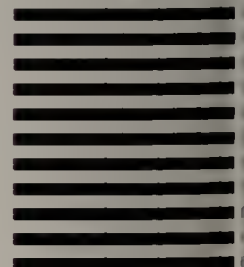
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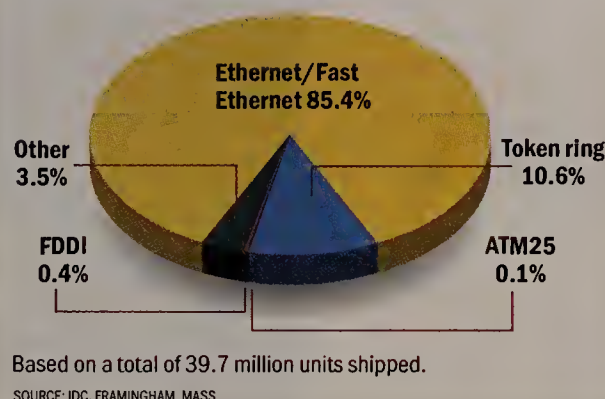
ATM in the LAN

The downfall of desktop ATM

By Jodi Cohen

ATM ANYONE?

ATM barely made a dent in Ethernet's share of the 1996 worldwide network interface card market.



the desktop.”

And unlike the LAN backbone, where customers are willing to pay big bucks to protect the core of the network, the desktop is a place where cost counts.

No shortage of obstacles

Another key reason for the failure of ATM25 is that it requires net administrators to swap out adapter cards. By contrast, many PCs now have built-in 10M/100M bit/sec Ethernet cards.

“The last thing that anybody wants to do is have to go out and touch every desktop,” says Esmerelda Silva, an IDC analyst.

Yet another factor holding back desktop ATM is the lack of applications.

“There really haven’t been any applications written for native ATM,” 3Com’s Shelef says. “They’re all written for IP.”

Saying that there haven’t been “any” applications written for ATM might be a stretch, given that Ralph Ungermann’s First Virtual Corp. offers multimedia software designed to take advantage of desktop ATM’s features. But even First Virtual earlier this year abandoned its all-ATM approach when the company announced products that provide quality-of-service (QoS) capabilities necessary for videoconferencing, broadcast TV and video on demand over Ethernet.

First Virtual’s offerings are among the first of what could be many new non-ATM products that feature ATM-like QoS capabilities.

These capabilities, once limited to the ATM world, will soon be available in Gigabit Ethernet switches using IP protocols such as Resource Reservation Protocol. Customers no longer will have to make the leap to ATM to gain the benefits of bandwidth reservation and other key QoS

parameters necessary for handling multimedia traffic.

ATM25 no longer holds a bandwidth edge, either. Customers that want high performance are likely to choose Fast Ethernet, Gigabit Ethernet or 155M bit/sec ATM, analysts say.

What about the benefits of running an all-ATM environment? Customers could have one technology that spans the LAN and WAN and could extend QoS capabilities across the entire enterprise.

That’s what originally attracted FORE customer Barr to ATM. He is running 25M bit/sec ATM to the desktop, 155M bit/sec ATM to file servers and 622M bit/sec ATM between buildings in his 150-node network.

“We went with 25M bit/sec ATM purely for speed . . . we don’t have any QoS requirements right now,” Barr says. “But we plan to do voice integration in a couple of years, so we figure it’s better to be prepared.”

But there are not many folks following in Barr’s footsteps. Instead, most customers are deploying switched Ethernet/Fast Ethernet at the desktop, even if they are using an ATM backbone.

“We sell all-ATM networks to some customers, but ATM desktop customers certainly are not the majority,” says FORE CEO Eric Cooper.

Yes, even ATM pioneer FORE is paying increased attention to alternative technologies, having acquired a trio of Ethernet switch companies that include Alantec Corp., Applied Network Technologies, Inc. and Scalable Networks, Inc.

Meanwhile, small ATM25 vendors Whitetree, Inc. and Avidia Systems, Inc. have been acquired this year by Ascend Communications, Inc., and PairGain Technologies, Inc., respectively.

Neither acquiring company is interested in becoming a big desktop player, and both seem intent to swallow up the ATM technology and apply it to ATM core switching, industry observers say.

While it might appear that the the ATM desktop market is dead or dying, Shelef says there is always a chance the technology still could catch on.

“I’m not convinced that ATM is a lost cause at the desktop. I guess it could have a comeback if some niche application were to become popular that would require ATM,” Shelef says. “But right now, [3Com’s] ATM25 sales are negligible.”

The company’s biggest ATM backbone customers — such as Adobe Systems, Inc. and Carnival Cruise Lines — typically use switched Ethernet to the desktop, he says.

All in all, it’s becoming harder and harder to think about ATM as an end-to-end network technology. ■

You don’t find a network customer like Barr Systems, Inc. every day. Not only has the data communications company deployed ATM in its backbone, but Barr also has rolled out the technology right to the desktop.

“We figure if we try to become a pure ATM environment, it will probably be easier in the long run,” says Tony Barr, president of the Gainesville, Fla., firm. “It’s a lot less complex to deal with one technology than a multitude of technologies.”

That’s what vendors of 25M bit/sec ATM (ATM25) technology have been trying to tell other customers, but few seem to be listening.

Less than 1% of all desktop machines have ATM25 connections, according to market research firm International Data Corp. in Framingham, Mass. And the prospects for that market share growing much seem dim given that technologies such as Fast Ethernet are less expensive, and few applications have been designed to take advantage of desktop ATM’s features.

“The world isn’t going to all-ATM networks, so desktop ATM just doesn’t make any sense,” says Steve Bell, president of Bell Consulting, Inc. in Cupertino, Calif.

Paying the price

You can’t blame desktop ATM’s failure to date on a lack of ATM25 hardware. More than a dozen LAN switch vendors — including 3Com Corp., Bay Networks, Inc., Cisco Systems, Inc., FORE Systems, Inc., IBM and Madge Networks, Inc. — feature ATM25 gear as part of their product portfolios.

Rather, pricing has been the main obstacle to ATM25’s low acceptance, says Nachman Shelef, vice president and general manager of 3Com’s ATM division. He points out that 25M bit/sec ATM has not been able to compete with Fast Ethernet on adapter or switch port pricing.

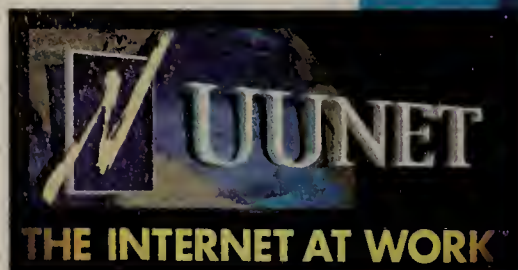
With Fast Ethernet network interface cards available for less than \$100, few customers would find even a \$200 25M bit/sec ATM NIC to be a bargain — and ATM card prices remain 50% higher than that. Also, 100M bit/sec Ethernet switch prices are plunging to less than \$300 per port, while 25M bit/sec switch ports cost around \$600 each.

Fast Ethernet NICs cost less than ATM NICs from the start, and ATM cards will never catch up, according to John McQuillan, president of McQuillan Consulting, Inc. in Concord, Mass.

“When Fast Ethernet NICs hit the scene in 1996, they cost half as much as current ATM NICs, which have been around for five years now,” he says. “LAN technologies that cost half as much may sell in volumes 10 times as great, and that’s why ATM will not be adopted widely at

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Briefs

■ When it comes to 56K bit/sec modem technology, **Bay Networks, Inc.** wants to be all things to all people. Already committed to backing the **K56Flex** modem technology supported by Rockwell International Corp. and Lucent Technologies, Inc., Bay last week announced it also would support the rival **56K bit/sec modem technology, x2**, from 3Com. By September, Bay will incorporate x2 modem technology in the digital signal processor-based Model 5399 Remote Access module.

The module resides inside Bay's remote access 5000 Multi-Service Access Switch. Bay says the modems will be upgradable to whatever 56K bit/sec modem standard is set by the International Telecommunication Union. A standard decision is expected early next year.

© 3Com: (800) 242-3266, ext. 6100; Bay: (800) 231-4213

■ IBM last week enhanced its **eNetwork Communications Server package** for the System/390 mainframe. The new features include a faster CICS TCP/IP interface, improved connectivity with IBM's Network Station and new TCP/IP routing support in the form of Routing Information Protocol Version 2. The eNetwork software packages are part of IBM's plan to revamp its existing Communications Server offering into a more open, multiprotocol package. The idea is to provide users with a set of integrated communications packages that offer universal access to host resources. The new TCP/IP features will be included in the OS/390 Release 3 package at the end of the month.

© IBM: (800) 426-2255

■ Unisys Corp. and Newbridge Networks, Inc. last week announced an agreement for **Unisys Global Customer Services Group** to resell Newbridge LAN and WAN networking gear.

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Telecommuting is more than hardware and software

Remote access not for the faint-hearted; bring aspirin to work when creating telecommuting programs.

By Tim Greene

While millions of dollars are spent each year on hardware and services to support remote access/telecommuting programs, MIS departments often are blindsided by unanticipated additional costs of setting up and supporting those programs.

As Lockheed Martin Corp., of Sunnyvale, Calif., found out when it streamlined its remote access network, some of its biggest challenges were administrative, not technical.

Items such as getting users to buy in to the company's standard telecommuting hardware package, setting up a help desk and keeping track of ordering phone lines vied for top priority.

provisioning) as well as staffing help desks can be so daunting that those who have done it would consider outsourcing if they had it to do again.

For example, the time spent by Hewlett-Packard Co. to discover the best way to set up its telecommuting program might have been less painful if the project was conducted by a consultant who already knew the ins and outs of supporting telecommuting efforts.

"I would definitely evaluate turning it over to someone else," said Jeff Freeth, transmission manager for HP.

Freeth wrote a specification for recommended user hardware and arranged for ordering analog phone and ISDN lines for his users. But some of the users ignored his suggestions.

Based on their own knowledge, they thought they could do it faster, cheaper and better, he said. Because use of Freeth's services is optional to users, that remains a problem.

Robert Heintz, president of the Helfrich Company in Irvine, Calif., which implements ISDN telecommuting programs for

corporations, said that lack of standardization can cause help desk problems. "It takes a unique staff to sufficiently isolate multivendor problems," he said.

Pacific Bell solved that problem by establishing a mandatory desktop standard of Windows for Workgroups on a Pentium-based PC, and all telecommuters got laptops.

"We don't support employee-owned computer equipment," said Emily Bassman, director of virtual office development for Pacific Bell.

Laptops are preloaded with security software, and modems are preconfigured for 800 numbers to call in to the network. That avoids many setup problems that could overwhelm the support staff, considering that 12,000 employees are eligible to telecommute, said Jeff Kohl, remote access integrator for Pacific Bell. "We're trying for one supportable infrastructure," Kohl said.

Laptops let users work from home or an office. In addition, if something fails, it is easy to bring the unit in for repair, Kohl said.

Heintz said tracking the or-

Telecommuting trouble

When you set up telecommuting programs, problems arise where you least expect them.

- ▶ Getting users to buy in to the officially sanctioned ordering and provisioning programs.
- ▶ Distributing hardware and software to remote users.
- ▶ Keeping track of user accounts and sending bills to departments for network use.
- ▶ Training a help desk to advise on nonuniform remote platforms.

ders for hardware, software and dial-up lines can be a full-time job.

Looking back on it, HP's Freeth said he would localize rather than centralize ordering phone lines. Personal relationships developed through local representatives can smooth out a lot of bumps, he said.

In any case, be prepared for a tough chore when setting up a telecommuting program, he said. "It's guaranteed to be bad for your health, give you gray hair and take 10 years off your life," Freeth said. ■

Get more Info online: **2817**

- Suggestions for setting up telecommuting pilot projects
- An update on a large-scale 1994 telecommuting project in Silicon Valley
- Links to telework centers, where workers go to telecommute

www.nwfusion.com

HP scraps Gradient license manager

By Jim Duffy

In response to user frustration, Hewlett-Packard Co. is replacing the license management component of OpenView with a simpler scheme.

The next major release of OpenView will not have Gradient Technologies, Inc.'s iFOR/LS license management system, said Jeffrey Scheaffer, licensing program manager for HP's Network Systems Management division. Users complained that iFOR/LS is too complicated and actually can disable OpenView.

"We've made the decision to get rid of it, recognizing that network licensing is frustrating [and that iFOR/LS] is sort of a sledgehammer," he said.

Gradient's iFOR/LS is responsible for doling out and

tracking OpenView licenses so users do not violate OpenView licensing terms with HP.

But iFOR/LS is a distributed system that requires knowledge of HP's Network Computing System remote procedure calls and could render OpenView useless if a server goes down or is corrupted.

"It's really bad," said Paul Edmunds of Duke Power Co. in Charlotte, N.C., and president of the OpenView Forum user group. "If a license server dies or gets into trouble, it's just a disaster. It's not a reliable process."

Instead, future versions of OpenView will default to a node-locked licensing scheme that will be part of Version 5.01 of OpenView Network Node Manager, due out imminently.

Currently, OpenView defaults

to iFOR/LS through node-locked licensing and is offered as an option in Network Node Manager 5.

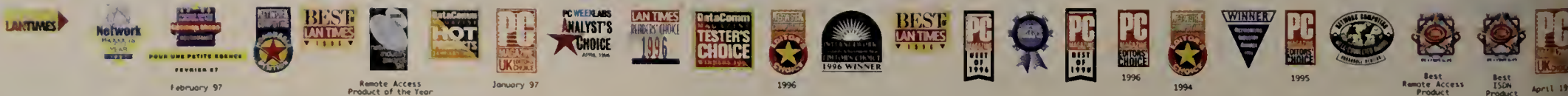
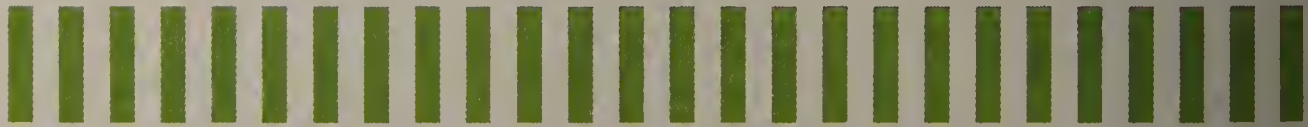
Node-locked licensing installs the OpenView license on the systems running OpenView and is not susceptible to network problems. Also, node-locked licensing requires no knowledge, configuration or management of NCS or iFOR/LS.

The alternative is a network license like those doled out by iFOR/LS. Network licenses allow many users to use a software product at the same time, provided there are enough licenses. While in use, a network license is flagged by the license server and is unavailable to other users.

Even though HP is yanking iFOR/LS, the company is deciding whether it should scrap networked licenses altogether. ■

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☐ 1-25 ☐ 101-500
☐ 26-100 ☐ 501+

When do you plan to implement a remote access solution?

☐ within 30 days ☐ 4-6 months ☐ 1+ year
☐ 1-3 months ☐ 7-12 months

How many employees at your site?

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☐ 101-250 ☐ 501-1000 ☐ 5000+

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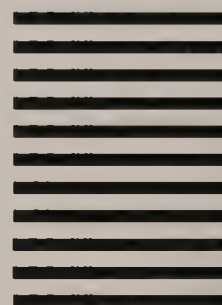
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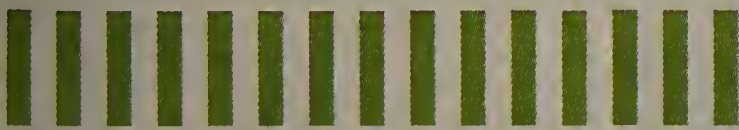
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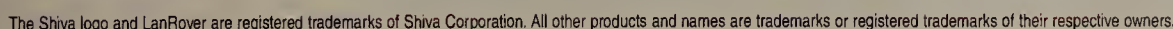
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ATM you can take to the beach

While ATM may be getting less press than it has in the past, there is no question that products using the technology actually are delivering the promise of

ATM's initial backers.

Time can do wonderful things for a technology, as current industry darlings — Gigabit Ethernet vendors — will find

out. This is especially the case when the ante is upped in terms of producing interoperable, industry-standard offerings.

For almost a full year, as part of The Tolly Group's ATM-Legacy LAN Integration project, we've been conducting what are arguably the most exhaustive system-level tests yet. We've built and documented sophisticated, multiproduct proto-

type networks, all with ATM at the core. These tests illustrate, in great detail, the integrating power of ATM.

The list of participants is impressive. To date, it includes 3Com, Bay Networks, Cabletron, CrossComm (Olicom), Digital, IBM and Xylan.

The goal of this ongoing project is to create "cookbooks" detailing the steps taken to build each prototype network. Unlike theoretical tomes or most product installation manuals, our cookbooks help the reader see and understand how complete multiproduct, multifunction ATM-based networks are built.

Given that the most often heard complaint about ATM is that it is too complex and difficult to understand, I expect many network managers will find, as I did, that the step-by-step approach taken here is enlightening.

As a starting point, we outlined three possible customer scenarios representing different approaches to an ATM migration strategy: LAN clients — Ethernet or token ring — linked to ATM-connected servers; ATM-connected stations communicating with legacy servers; and ATM used as the transport between legacy LAN environments.

From a technical viewpoint, scenarios one and two are identical. Not surprisingly, ATM LAN Emulation 1.0 (LANE) was the key component of virtually every solution. While the ingredients may have been similar, the recipes varied dramatically. Some vendors required far more or far less manual configuration than others.

By following the step-by-step processes of different vendors attempting to solve the same legacy-to-ATM integration problem, one can gain critical insights into the capabilities and complexities of various ATM switch products.

Diversity was a hallmark of this project. LAN topologies included Ethernet, Fast Ethernet and token ring. Connectivity across ATM was shown using transparent, source route, source routing transparent and translational bridging. Native routing of IP and IPX were in the mix as well.


One vendor even included Synchronous Data Link Control, frame relay and ISDN among the legacy communications approaches that could be integrated into an ATM backbone.

While tests still are being conducted, many of these cookbooks are available for download from our Web site (www.tolly.com). So if you were wondering what you should take with you to read on the beach this summer, your problems are solved. Let me know what you think.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or via the Internet at ktolly@tolly.com or www.tolly.com.




Kevin Tolly



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12 Key Benefits of Attending

1. Explore the inherent benefits of using frame relay
2. Learn when frame relay is a more economical solution than other service options
3. Understand the benefits and limitations of NNI connections
4. Discover which frame relay service features are significant and which are merely hype
5. Gain an understanding of the direction of the frame relay market
6. Analyze the differences between the major frame relay providers
7. Learn how to save money by consolidating your voice and data applications over frame relay
8. Understand the alternative approaches to running SNA applications over frame relay
9. Learn how pricing structures differ among carriers and how to take advantage of these differences to obtain the best service bargain
10. Analyze case studies of various network types to see how frame relay can be best implemented
11. Understand what network management options are available and the pros and cons of outsourcing vs. in-house network management
12. Learn about new and likely future service enhancements which could impact your network

Seminar Overview

Frame Relay offers companies the chance to increase network performance while decreasing their costs of operations. As a result, frame relay has become the fastest growing data service in the industry and is only matched by the growth rate of the Internet. In fact, according to the 1997 *Network World* 500 survey, over 74% of leading network IS professionals at the largest U.S. companies have already implemented or plan to implement frame relay to give them efficient and effective wide area communications.

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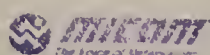
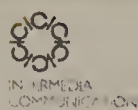
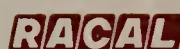
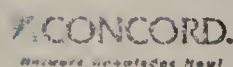
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Carriers & ISPs

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Briefs

■ **NYNEX Corp.** late last month announced its Internet plans, which include teaming up with America Online, Inc. subsidiary **ANS Communications, Inc.** to resell ANS managed Internet connections, remote dial access, virtual private networks, Web hosting and security.

The two companies also will collaborate with Sun Microsystems, Inc. and Avesta Technologies, Inc. (makers of intranet software) on features designed specifically for financial services companies.

■ **Nokia Corp., Ericsson, Inc., Motorola, Inc. and Unwired Planet, Inc.** are working together on a common **Wireless Application Protocol (WAP)** that will let users access the Internet from wireless devices via a standard interface.

The group of vendors are combining their separate efforts into a single protocol. WAP will be based on Nokia's Handheld Device Markup Language, Unwired Planet's Handheld Device Transport Protocol and Ericsson's Intelligent Terminal Transfer Protocol. WAP will make it easier to **support interoperability among multiple vendors' products.**

The protocol will include parameters that will let users manage personal telephone profiles, support unified messaging and access the Internet or corporate intranet on a single device.

■ Numerous parties are asking the **Federal Communications Commission** to select **Mitretek Systems, Inc.,** an environmental and health care systems contractor, as the **new administrator of telephone numbers** to succeed Bellcore.

Mitretek came in a close second to defense contractor Lockheed Martin Corp. in recent balloting by the North American Numbering Council.

ISPs may reap benefits of Gigabit Ethernet

By Charles Bruno
Tampa, Fla.

Bill Manning warned a throng of Internet service providers recently that the public facilities many ISPs employ to connect with one another are choking under enormous loads. But he feels Gigabit Ethernet may help ease congestion.

Manning, a project manager at the University of Southern California's Information Sciences Institute, told attendees at the

recent North American Network Operators Group meeting here that an injection of Gigabit Ethernet switches would clear blockages at network access points (NAP) and metropolitan-area exchanges (MAE). NAPs and MAEs serve as public interconnection sites where even the smallest of ISPs exchange with other providers.

The Gigabit Ethernet switches would sit on-site at the NAP or MAE premises taking in traffic from IP routers. The switches would be interconnected to form a high-speed backbone over which the IP traffic would flow.

Such an upgrade would exponentially increase the bandwidth public ISP exchanges

currently support and, in the process, could improve response times for end users.

Gigabit Ethernet will be the panacea for public exchanges, Manning said. They will be able to attach more users without being constrained by their on-premises technology.

But some large ISPs are convinced that public exchanges have outlived their usefulness, and they are shedding them for private peering links. The links allow large ISPs to better regulate the traffic that finds its way onto the provider's network.

"Sure, Gigabit Ethernet will make a shared interconnect viable for people who use that model," said John Curran, chief

technology officer at BBN Communications, Inc. "But let's be frank. Gigabit Ethernet used in private interconnects will still let you handle orders of magnitude greater traffic."

The flip side of Curran's argument for private interconnects is they allow only the largest of ISPs to peer with one another. That, in turn, relegates smaller players to public interconnection points and

forces many of them to pay for transit services across large ISP networks.

One public interconnect provider, MFS Datanet, which operates MAE-East and MAE-West — two of the largest public interconnects — is eyeing ATM to remedy congestion woes.

ATM appeals to MFS Datanet largely because the company is more familiar with it from its carrier business, according to Matt Parnell, senior product manager in charge of the MAEs.

Like other public interconnects, the MAEs use Digital Equipment Corp. GigaSwitch FDDI switches, as well as shared Ethernet access.

Upgrade interest

Gigabit Ethernet start-ups said they are beginning to get feelers from ISPs and interconnect providers to provide switch upgrades. George Prodan, vice president of marketing at Extreme Networks, Inc., said his company's Summit switches will establish a gigabit backbone at interconnect sites and pull traffic off ISP routers that skim data off the 'Net.

Moreover, the vendor will offer its ExtremeWare, which will enable users to set policy-based quality of service.

Bobby Johnson, Foundry Networks, Inc. president and CEO, said Gigabit Ethernet will prevail at public interconnects. It lets you keep Ethernet frame sizes, and you don't worry about the overhead of ATM, he said. ISPs and their interconnect points will wind up enjoying massive bandwidth. ■



Foundry Networks'
Bobby Johnson

Get more info online:

- A summary of the talk by USC's Bill Manning
- A description of one network access point (NAP) and how it works
- A look at how ISPs are bypassing NAPs with their own interconnects



Cable & Wireless joins int'l ATM party

VBR circuits slated as international private-line option.

By David Rohde
Vienna, Va.

Cable & Wireless, Inc. last month became the latest in a recent series of carriers to make international ATM service commercially available.

The U.S. subsidiary of U.K.-based Cable & Wireless plc launched a service called Global ATM, which offers variable bit rate, nonreal-time virtual circuits. Because such circuits are not optimized for delay-sensitive voice and video traffic, they are expected to be used first as an alternative to high-capacity private data lines.

U.K. link

Like similar commercial launches this year by AT&T and MCI Communications Corp., Cable & Wireless' offering begins with service between the U.S. and a single country. The first phase of Global ATM is a trans-Atlantic link to the U.K., just like MCI's international ATM service launched in March. AT&T's first destination for its international ATM service is

Japan (NW, June 2, page 12).

Cable & Wireless' offering is based on Northern Telecom, Inc.'s Magellan Passport ATM switches installed on both sides of the Atlantic. Users can purchase permanent virtual circuits (PVC) with sustained cell rates of

ATM ACROSS THE SEA

Cable & Wireless' monthly charges for a 10M bit/sec ATM link between New York City and London:

● DS-3 access line in New York	\$5,700
● DS-3 ATM port in New York	\$10,000
● 10M bit/sec permanent virtual circuit*	\$96,100
● E-3 access line in London	\$2,100
● Special U.K. "gateway charge"	\$2,000
Total	\$115,900

* Variable bit rate, nonreal-time circuit suitable for data only, with a 5M bit/sec sustained cell rate, or committed rate of nondropped cells.

Term and volume discounts not included.

2M to 20M bit/sec. Despite the choice in circuit-speed options, the only port speed available is a full DS-3, or 45M bit/sec. So all Global ATM users will have to purchase typically pricey DS-3 access lines from the user premises to the Magellan switch site.

And the service itself is expensive, with most user implementations expected to generate a six-figure bill for a single point-to-point connection (see graphic). But Cable & Wireless officials said the service still provides some savings when compared with international private lines.

For example, a user that purchases five E-1 (2M bit/sec) trans-Atlantic private lines to achieve the same bandwidth as a single 10M bit/sec ATM PVC would pay \$169,700 per month before contract discounts, or 32% more than the ATM user. In addition, the user would face an additional traffic engineering challenge because Cable & Wireless does not inverse-multiplex E-1 circuits to provide a single 10M facility. ■

EYE ON THE CARRIERS

AT&T strikes out in Chicago

Telecom analysts agree that buying local exchange service from a new carrier that is merely reselling regional Bell operating company lines is useless —

because no cost savings are available — or dangerous — because both carriers will point fingers if something goes wrong.

So whenever someone asks why

AT&T's local strategy depends so heavily on reselling RBOC lines rather than building their own networks, AT&T executives point to Chicago. That's where AT&T is installing three local exchange switches, laying hundreds of miles of new fiber and deploying a new fixed wireless local loop system. Or so they say.

My recent interview with Bill Ketchum,

president of AT&T's Central States region, shed new light on the carrier's activities in the Windy City.

It turns out that AT&T actually has turned up only one Lucent Technologies 5ESS switch for local exchange service. It's not even clear whether any traffic is passing through the switch. The other two switches aren't operational, and Ketchum said he wasn't sure whether they've even been delivered yet.

The fiber? "I can't tell you how many miles are in the ground," Ketchum said. That's odd because every other competitive access provider in the country can give you that figure.

The wireless local loop situation is weirder still. AT&T announced the system in February. It involves a small transceiver mounted on the exterior of the customer premises. It communicates via digital personal communications services (PCS) cell sites to AT&T central offices, bypassing the RBOC.

At the time, the carrier said the system would be tested at AT&T employees' homes in Chicago later in the year. Ketchum now says the test has been put off until January and will involve 15 to 30 employees' homes. Why the delay? "The actual hardware and antennas to support the trial won't be ready until the end of the year," Ketchum said.

In other words, a ridiculously tiny beta test is now slated to begin a year after the announcement, with no schedule for commercial deployment.

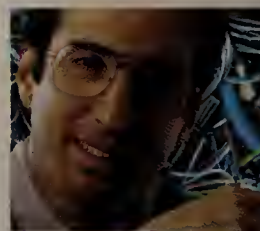
Let's face it. AT&T still has not decided to become an alternative local exchange carrier in any meaningful way. There's nothing irrational about that, actually. AT&T could have simply declared, "We've examined the market opportunity, determined the costs are too great, and we'll pass at this time."

But that wouldn't serve AT&T Chairman Robert Allen's goal of blaming RBOCs for a telecom reform stalemate. That gave him a rationale for attempting to merge with the biggest RBOC, SBC Communications — to deliver it from the sins of monopoly.

Now that the AT&T-SBC deal is dead, how much more energy will AT&T fake in local telecom competition? It's jarring that the company has become so desperate to promote its story that it is employing a form of vaporware that would make even the most hyperactive IT marketing manager blush with embarrassment.

And it's sad to see Ketchum and so many fine AT&T marketing and public relations people being forced to play-act at local market entry while Bob Allen searches for an easy way into the local market instead of doing the hard work that's really necessary.

Rohde is Network World senior editor of Carriers & ISPs. He can be reached at david_rohde@nw.com.



David Rohde

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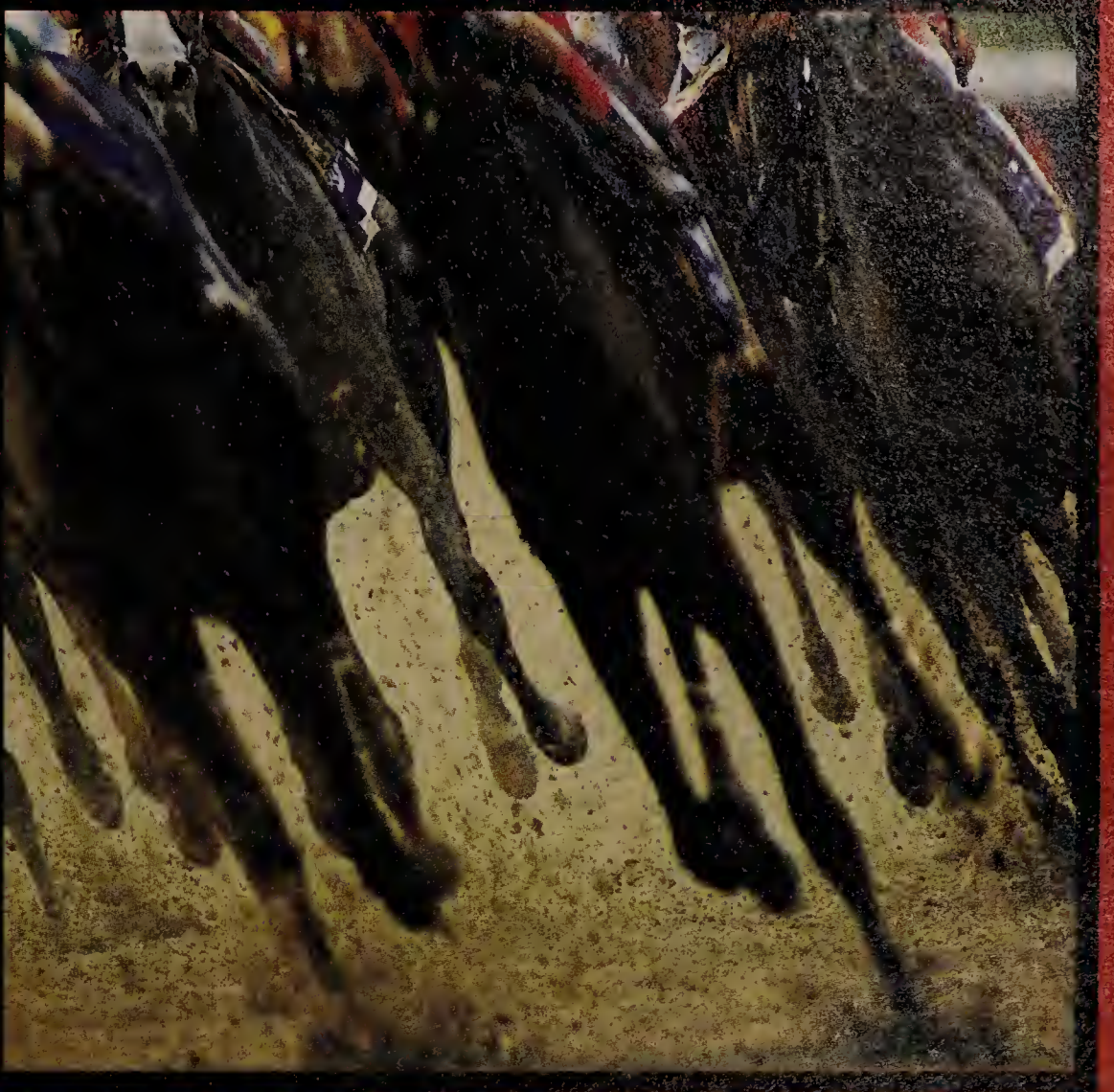
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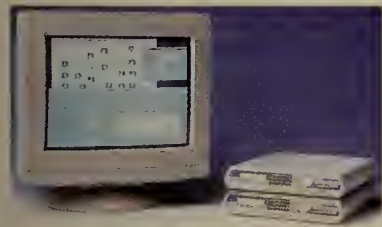
Briefs

■ **Progress Software Corp.** has snapped up Java tools start-up Apptivity Corp. in a cash and stock deal valued at \$13 million. The acquisition announced last week will add Java-based client/server development tools to Progress' product line, which includes its flagship fourth-generation language client/server tools and more recent WebSpeed HTML tools.

Apptivity, founded in April 1996 and based in Newark, Calif., will become a product unit of Progress, which is located in Bedford, Mass.

Apptivity's founder and president, Purna Pareek, will become a vice president at Progress and report to its president, Joseph Alsop.

■ **Radguard, Inc.**, an Israel-based encryption vendor whose products are used by the Israeli



Radguard's NetCryptor IP-based encryption device.

defense department, just opened a U.S. office in Rochelle Park, N.J. Radguard sells NetCryptor, an IP-based encryption device based on the emerging IPsec standard using the ISAKMP/Oakley key management technology.

© Radguard: (201) 909-3745

■ **Pacific Software Publishing** has released VB Bridge, a software program that lets Visual Basic applications run on Microsoft Corp.'s Internet Information Server.

VB Bridge also supports Microsoft's Internet Server API, a faster alternative to Common Gateway Interface scripts. VB Bridge starts at \$99.

© Pacific Software Publishing: (206) 688-8080

Consortium takes a shot at sorting out Web user privacy and business marketing interests

Questions arise about whether Netscape's standard proposal will serve end-user needs by protecting their privacy.

By Ellen Messmer
Cambridge, Mass.

The World Wide Web Consortium (W3C) is trying to strike the right balance — a balance between Web site operators' need to collect information about visitors for marketing purposes and visitors' right to privacy.

However, as work on the group's Platform for Privacy Preferences (P3) project gets underway, some observers are concerned that the W3C's high ideal of user privacy may be falling victim to the more base desire of making a buck off valuable user data.

The P3 specification is supposed to define a common format for letting an end user view a Web server privacy policy before the user's browser releases end-user data. The W3C said it hopes to have its recommendation out by fall.

Profiles in privacy

The P3 format includes a range of privacy profiles, such as whether the Web merchant will resell the data the user discloses or otherwise recycle it for marketing purposes, according to Tim Berners-Lee, W3C director and inventor of the Web.



- Technical proposals related to the Privacy Preferences Project
- Results of a survey of 100 frequently visited Web sites on their privacy policies
- A link to a site that lets you surf the Web anonymously

"The basis of P3 is that on the user side, there is a right and a choice to how that information is used," Berners-Lee said.

Berners-Lee announced the P3 initiative at last month's

Federal Trade Commission (FTC) hearings in Washington, D.C.

The FTC, which is concerned that consumer privacy has been largely ignored as Web-based electronic commerce grows, last month spent a week hearing testimony about current online marketing practices.

The W3C picked up the P3 privacy policy idea from the Internet Engineering Task Force's (IETF) Internet Privacy Working Group.

The IETF group came up with the concept "as the first attempt to implement notice and choice within the framework of the Internet," said Deidre Muligan, staff counsel at the Center for Democracy and Technology (CDT), an IETF participant.

The idea is that Web site operators can detail their privacy practices, even creating different policies for each Web page.

At the FTC hearings, Berners-Lee gave a demonstration of

what he called a P3 mock-up, showing how an end user could call up a Web site's privacy policy before providing personal information.

OPS in question

However, observers said it is questionable whether this stringent privacy element actually will make it into the P3 specifications planned for release within a few months.

The outcome is questionable because the technical foundation for P3 is the Open Profiling Specification (OPS), which mainly focuses on how to efficiently transfer user data, not keep it private.

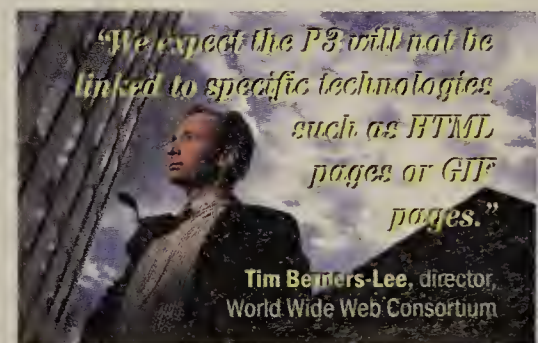
OPS was submitted to the W3C as the basis for P3 by Netscape Communications Corp. and Cambridge, Mass.-based start-up Firefly Network, Inc. OPS is based on Firefly's client/server Passport technology, said Saul Klein, Firefly's vice president of marketing.

The Passport client software lets end users quickly transmit data about themselves to Web servers running Passport software.

This setup can simplify credit card processing or the delivery of information of interest to end users.

Barnes & Noble, Inc. and Yahoo, Inc. are among the sites using Passport, Klein said.

However, privacy advocates stressed that OPS has no mechanism



for reviewing privacy policies — P3's stated goal.

"P3 is about protecting privacy. It would let me ask, 'What are your data practices?'"

See W3C, page 40

White Pine loses CEO, redirects product focus

Vendor to zoom in on core competencies, conferencing products, including CU-SeeMe.

By Rebecca Sykes
Nashua, N.H.

White Pine Software, Inc. has announced the resignation of its CEO as well as cost-cutting measures that include laying off 20% of the company's work force and plans to cease support for some legacy products.

The company said Howard Berke is leaving his posts as CEO, president and chairman for personal reasons, but will remain on the company's board of directors and serve as a consultant.

The responsibilities of president and CEO will be assumed on an interim basis by Killko Caballero, who is currently White Pine's senior vice presi-

dent and chief technology officer.

Caballero had been president of France's About Software Corp., which White Pine acquired in 1995.

As for cost-cutting measures, work force reductions will leave White Pine with about 100 employees.

The restructuring will result in a onetime charge against earnings of \$650,000 to \$850,000, which is necessary to get costs under control, according to Christine Cox, White Pine's corporate controller. Factored into the restructuring charge are severance expenses and software license write-offs,

Cox said.

"Our expenses were vastly out of line with our revenue stream" over the past several quarters, she said.

White Pine's products include CU-SeeMe, Internet and intranet videoconferencing software, and WebTerm, a Web-to-host connectivity package.

The company declined to say which of its legacy products will be phased out to cut costs.

White Pine will redirect its energies on its core products, which include CU-SeeMe, MeetingPoint and WebTerm.

Sykes is a correspondent with IDG News Service's Boston bureau.



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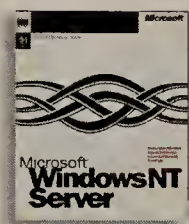
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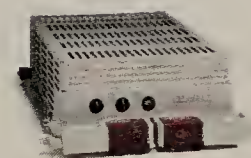
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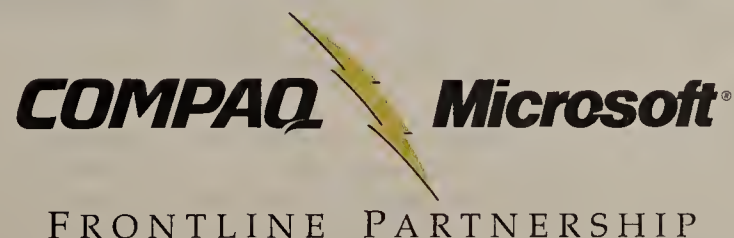
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Lansoft jazzes up mail outsourcing service

Internet messaging offering targets Exchange, GroupWise and Notes users.

By Paul McNamara
Columbus, Ohio

Lansoft USA, Inc., of Columbus, Ohio, is expanding the reach of its Jazz Internet e-mail service to include users of Microsoft Corp.'s Exchange, Novell, Inc.'s GroupWise and Lotus Development Corp.'s Domino/Notes.

The Lansoft service, which includes free Simple Mail Transfer Protocol access software that runs on Windows 95 or NT, allows a company to establish a virtual connection to the Internet from any Internet service provider. The company's e-mail is transported over the virtual connection to the Lansoft mail server, where it is distributed

through the Internet. Incoming mail travels the same route but in the opposite direction.

Connections can range from dial-up to T-3.

This outsourcing saves money for a company by eliminating the need to pay for leased phone lines, routers and firewalls, and maintenance of a separate Post Office Protocol 3 mailbox for each employee, according to Lansoft. Generally, companies still maintain their existing e-mail server.

With prices based on transmission volume, a typical Jazz customer can expect to pay between \$20 and \$100 per month for an unlimited number of users, in addition to a standard

ISP connection fee.

One Jazz beta tester, whose company has 25 Exchange users and no full-time IS director, said his shop is anxious to have an Internet e-mail connection without handling the administrative chores.

One less headache

"It's just one less thing that I have to deal with," said Marc Bushell, vice president of Rempac Foam Corp., a manufacturing company in Clifton, N.J. "I've had Jazz running for about 30 straight days and am very happy with it."

Bushell said he would like Lansoft to refine its service to allow him to have mail automatically retrieved only during business hours.

The Jazz service currently supports Message Handling System-compatible clients such as DaVinci Systems Corp.'s DaVinci eMail and IBM's Office Vision, as well as Lotus' cc:Mail.

The Exchange, Groupwise and Domino/Notes services are in beta and are expected to be available by summer's end, according to a Lansoft spokesman.

© Lansoft: (800) 526-7638 or (614) 786-1713

PROFILE: LANSOFT USA, INC.

Based: Columbus, Ohio

Founded: 1993

Primary products: Jazz, an Internet e-mail outsourcing service that includes SMTP access software

InterHub Network, another Internet e-mail service that allows customers to connect to Lansoft computers via a long-distance or 800 number

Management: Alan Abdullahi, president and CEO

Fun fact: Lansoft provides Internet e-mail service to the Pittsburgh Pirates Major League Baseball team

Passport keeps Java applets on the server

Company's IntRprise 1.1 development tool can help minimize network traffic.

By John Cox
Paramus, N.J.

Passport Corp. has created a unique way to deploy client-server applications to Java-enabled Web browsers by sending messages instead of full Java applets over the network.

The approach is part of Passport IntRprise 1.1, a fourth-generation language development tool that, for the first time, supports Java. Programmers can build new Java-enabled programs or relink existing Passport programs to run within browsers.

With IntRprise, Web browsers log on to the server and download the new Passport Java Presentation Protocol and a compact Java client. The server programs send messages, or instructions, to the client, which processes them to create the correct on-screen displays.

By contrast, in the typical Java

applet model, entire Java programs are downloaded from the server to the desktop.

The new protocol and Java client work with any Java browser, and coding in Java itself is unnecessary.

Less is more

Company officials said this minimalist approach means applications run faster over the network compared with downloading Java applets or moving entire screen displays over the net. Alan Tonnesen, Passport founder and chairman, said Java is not inherently a thin-client technology.

Poor application design can create big programs that eat up network bandwidth and local processing power.

"If you look at demonstrations of Java programs, they've preloaded the fat Java client to avoid these long downloads and

bring it up faster," he said.

Traffic control

IntRprise uses an asynchronous publish/subscribe messaging technique that Tonnesen said can cut network traffic compared with synchronous techniques "by up to 50% if you use it right."

IntRprise is a tool for building server-based programs, with built-in encryption, messaging, data access management and fault tolerance.

The tool set integrates with a range of third-party transaction and messaging systems to connect to host-based applications and data.

The applications themselves remain on Passport servers.

Passport IntRprise 1.1 is available now on Windows, Open/VMS and Unix platforms. For one developer, the price is \$8,995. ■

Network Computers

New thin client accesses Windows and Java apps

NeoStation also can tap into Unix and legacy applications

By John Cox

King of Prussia, Pa.

A new thin-client machine will let companies give end users access to server-based Windows applications and add access to Unix, host and Java applications as needed.

HDS Network Systems, Inc. has designed its NeoStation to meet customer demand for a low-cost, easy-to-manage desktop computer that can access new and legacy applications, said Michael Kantrowitz, HDS' executive vice president. The company has plans to change its name to Neoware Systems, Inc. Aug. 1.

NeoStation is about the size of a hardbound book, taking up less than 15 square inches on a desktop. It includes a keyboard and mouse and comes with 8M bytes of memory, which can be doubled by adding a plug-in card.

NeoStation is available with three software packages based on the company's netOS multi-threaded operating system, which takes up 1M byte of storage space.

ICA is used for accessing Windows applications running on Citrix's WinFrame multiuser version of Windows NT or on the Citrix-based NTrigue server from Insignia Solutions, Inc. Microsoft has endorsed ICA as the preferred way for non-Windows clients to access these servers.

A second package called netOS for the Enterprise adds 32 terminal emulators and the X protocol to access Unix servers.

The third package, netOS for Intranets, turns the NeoStation into a network computer that gives end users access to Java applets and applications running on networked servers. It also includes Navigator and Spyglass browsers, Internet e-mail and a news reader.

The company will continue to sell its larger @workStation device, which comes equipped with the software needed to run Java applets locally and browse the World Wide Web. Users can add a floppy or hard disk drive. The device can plug directly into any Ethernet network.

NeoStation is designed to meet demand for a low-cost, easy-to-manage desktop that can access new and legacy apps, according to HDS' Michael Kantrowitz.

HDS' (NEOWARE) THIN CLIENT ADAPTS TO USER NEEDS

One version of the NeoStation network computer (the upright black box next to the monitor) lets users access Windows applications on a server. By adding optional software, the NC also can access Unix applications or, in the full-featured version, mainframe applications and run a Java Web browser, e-mail and a news reader.

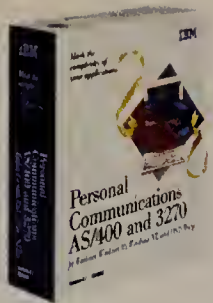


The first package includes netOS for Windows Terminals, which turns the NeoStation into a device for displaying Windows applications that are actually running on a server. The software supports Citrix Systems, Inc.'s Independent Computing Architecture (ICA) protocol.

The NeoStation lacks these hardware options but lets customers add capabilities via software. The software downloads from any server via a simple file transfer.

The NeoStation is shipping now and starts at \$649.

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NET INSIDER

Close by from far away

I'm writing this somewhere over the South China Sea early into my flight back home from INET '97 in Kuala Lumpur, Malaysia. Traveling through 12 hours worth of time zones actually requires spending a full day in cramped airline seats, and I continue to be amazed at what they call food up here.

INET is the Internet Society's (ISOC) annual meeting. It brings together hundreds of Internet luminaries, politicians and more than a thousand others interested in or concerned with the Internet to explore the current state and issues surrounding the Internet, its growth and its impact. For the few of you who do not know, the ISOC is an international mem-

bership organization whose mission is to foster the growth of the Internet and support organizations, such as the Internet Engineering Task Force, that are key to the continued development of the Internet.

ISOC has corporate and individual members; as an elected trustee, I'd like to encourage corporations that benefit from the Internet and individuals who, one way or another, are in the Internet biz to consider joining if they are not

already members. If you are interested, please send me mail or take a look at the ISOC Web page (www.isoc.org).

As it has for the past four or five years, ISOC held a week-long developing countries workshop

associated with the INET meeting. There were about 130 students from about 75 countries attending this year.

The workshop is designed to provide the students with background, information and training so they can help create or expand the 'Net in their own countries. I was one of the instructors in the network management track, and it was great working with the students and getting to understand what is, or is not, going on Internet-wise in their countries.

One thing that particularly struck me this past week is how, for much of what I do in the way of work from day to day, it did not matter that I was half a world away. Internet connectivity was fantastic at the workshop site and at the conference.

This allowed me to set up my laptop to duplicate my at-work and at-home configurations with no functionality and little performance penalty. To me, this was a portend of the future of this thing we now call the Internet. If done right, and if connec-

tivity for INET was done right, the 'Net not only keeps people from knowing you are a dog (as *The New Yorker* cartoon put it), but also keeps people from knowing where the dog is. The only major difficulty I found is not one that quickly will be solved by technology. It was quite a bit harder to work out of sync time-wise with the people with which I needed to interact.

Getting up as they were going home from work did make things a bit less efficient.

It will be a rather different world when the effect of distance is mitigated to the extent that I experienced at INET. But it still will be very nice to get back to my own house and SO (significant other).

Disclaimer: Harvard does not have a presence in Kuala Lumpur (yet), so the above are my observations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



Scott Bradner

W3C

Continued from page 35

Mulligan said. "But OPS doesn't give me any information about the data protection practices of the entity you are dealing with. OPS is about transferring data."

"That observation is not completely incorrect," said Joseph Reagle, a policy analyst at the W3C.

He conceded that the privacy part of P3 needs work.

But OPS will definitely be a part of P3, said Philip DesAutels, who is managing the P3 effort. "We are not modifying OPS," he said.

About 30 W3C member companies — including AT&T, Microsoft Corp., IBM and Netscape — met two weeks ago to hold the first meeting regarding P3.

Although Netscape arch rival Microsoft has publicly voiced support for OPS, there could still be a dogfight over P3 at the W3C. Microsoft submitted a P3 proposal of its own. ■

Ethernet Performance Been A Little

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Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I have hooked up two offices in the same building via two twisted pairs connected to a hub. But I get a lot of collisions and cannot establish a network connection, probably because the lines can't handle 10M bit/sec transmissions. I want both offices to remain on the same net and would like to keep using the hub.

Can you recommend a solution? I need something simple with good bandwidth — more than 28.8K bit/sec — and could possibly work over lines that are less than Category 3 cable. I thought bridges might work.

Via Network World Fusion

Part of your problem might have to do with the distance at which you're trying to run the connections. Try putting an additional network card in each server, then use the cards to provide a server-to-server link. This should help reduce the collision problem. You may have a hard time finding a solution if Category 3 wiring is a concrete requirement. Depending on how the building is wired, you might have to consider fiber-optic cable. This is especially important if separate power panels or transformers feed the areas of the building involved. When connecting networks in this situation, you can have issues with differences in ground potential. This can lead to problems with LAN communications, floating voltages because of power problems between the two locations and others.

Using fiber-optic cable allows you the maximum bandwidth possible. Both offices would still be on the same network but would be using different network numbers. The advantage to this solution is that if a network card starts jabbering, it won't take down both networks.

Bridging the networks could potentially cost more than the solution outlined above. It is possible to establish an asynchronous-like connection using short-haul modems, but this would result in poor performance compared to what you can get with a fiber-optic connection.

WAN service level management could keep your feet out of the fire, ensure carrier diligence

By Robert Markovich

In the past, corporate IS departments had control of the LAN and WAN components of their private networks. Because of this, metrics such as network availability, throughput and delay were manageable.

However, the migration from private WANs to public WANs has changed that. Currently, corporate IS departments do not have visibility into or control over their public WAN services. Yet they are still accountable for overall network performance. Their feet are held to the fire by end users, so they must ensure that their carrier is as diligent about service quality as they are. This is why WAN service level management is so important.

WAN service level management is a collaborative approach made by the subscriber and service provider for managing the service quality of public network services.

It is collaborative in the sense that both parties work together to plan, monitor and troubleshoot WAN service quality. This benefits the network manager who is trying to deliver the quality that meets business needs at the lowest possible cost.

If used correctly, WAN service level management provides a number of benefits. For example, subscribers can increase network availability and performance, reduce recurring support costs and ensure that business needs are met at the lowest bandwidth costs possible.

Service providers can reduce operational support costs, prioritize response to trouble tickets, set expectations for service quality and help justify recommendations to upgrade bandwidth.

However, given the lack of historical data and the amount of work that is needed to collect

WAN service quality information, it's no wonder companies have a difficult time implementing a process for WAN service-level management.

Filling the gap

A new breed of system is emerging that provides the functionality to automate the collection, interpretation and presentation of WAN service level information.

WHAT'S IN A SERVICE LEVEL AGREEMENT?

Users need to set specific levels of cost, performance and reliability in their service contracts. These levels can then be monitored by service level management systems.

Typical guarantees:

- ▶ No more than one hour of unscheduled network downtime during the year.
- ▶ Host systems will experience no more than 20 minutes of unscheduled downtime per year.
- ▶ Customer service calls will be answered by the fourth ring.
- ▶ WAN links will not be more than 70% utilized during peak hours.
- ▶ E-mail will be restricted to 3% of network traffic during peak hours.
- ▶ Application timeouts will occur less than once for every 50,000 sessions.

SOURCE: DECISYS, STERLING, VA.

There are three primary components to a service level management system: data collection, data interpretation and data presentation.

The data collection component typically deploys intelligent expert agent software at each WAN access point to perform circuit management — physical and logical layer service monitoring — and application traffic management.

These agents may be embedded into the WAN access equipment, such as DSUs/CSUs, smartjacks, WAN adapters or multiplexers.

In order to minimize bandwidth overhead created by management traffic, the agents should nonintrusively collect service quality information and

process the data locally. Therefore, network managers do not have to rely on bandwidth-consuming centralized polling to collect performance data. Performance data should be uploaded in bulk transfers when the WAN is idle.

In the data interpretation arena, centralized management software on a server can automate the uploading and archiving of performance data.

This centralized middle manager or server should provide partitionable databases and flexible access control mechanisms. This way, service providers could securely offer access to the performance information for each subscriber, enabling the collaborative approach of WAN service level management.

It's important that the system has an open architecture, as well.

For example, standard APIs could allow databases of performance data and events to integrate with other management applications, such as those used for network modeling, event correlation and trouble ticketing.

Finally, service level management systems should present service data in easy-to-understand formats with the ability for multiple users to access the system.

This information also should be presented in a way that correlates performance data on a networkwide basis.

In addition, a variety of management platforms must be supported, including Web browser access.

Until now, the tools that would make WAN service level management possible have not been available.

Traditional test equipment, circuit/device management tools and Management Information Base polling applications are unable to manage WAN ser-

vice levels. Why? They all lack the ability to access and archive the detailed data required for a meaningful assessment of performance across the entire WAN. These tools often are labor-intensive because they haven't been automated to keep up with constant network changes and increasing complexity.

WAN service level management is a concept whose time has come. Subscribers and service providers can now take advantage of the business benefits it provides, such as the reduction of operational costs and improvement of overall net quality.

Get more online:

- A look at new service level management tools from 3Com and InfoVista
- An overview of frame relay service management issues



www.nwfusion.com

But equally important, WAN service level management facilitates a partnership between subscribers and service providers. This partnership reduces finger-pointing, makes both sides accountable for the quality of WAN networking and ultimately furthers the business goals of the subscriber and service provider.

Markovich is vice president and cofounder of Visual Networks, Inc., a circuit management vendor based in Rockville, Md.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney by phone at (508) 875-6400 or via the Internet at mcooney@nww.com.



The feds wise up, but the real work lies ahead

Is Uncle Sam getting smart about the Internet? Based on developments within the executive and judicial branches in the past couple weeks, the answer seems to be yes. (As Jack Nicholson said as the president in *Mars Attacks*: "I want the people to know that they still have two out of three branches of government working, and that ain't bad.")

Two weeks ago, the Supreme Court stomped on the ill-conceived Communications Decency Act, and last week, the Clinton administration released a long-awaited policy statement on the Internet and electronic commerce. The report echoed many of the recommendations we outlined for government in our special story, "A Call to Action" (NW, March 31, page 1).

We urged the feds to avoid the temptation to tax and regulate the Internet to death and to focus instead on resolving the legal issues that could slow development of e-commerce.

The "Framework for Global Electronic Commerce" report (www.whitehouse.gov/WH/New/Commerce/) embraces those principles fairly directly. It says the private sector should be the driving force behind development of the Internet and the government should encourage self-regulation of this emerging business world.

The report also states that "governments should refrain from imposing new and unnecessary regulations . . . new taxes and tariffs on commercial activities," adding that the government should "support and enforce a predictable, minimalist, consistent and simple legal

environment for commerce."

But the report is simply a statement of direction, and the real work — work that will test the resolve of the Clinton White House — lies ahead. Policy positions must be fleshed out by the administration working with international governments and commercial groups, as well as states.

For example, while the feds eschew new taxes and tariffs, states and foreign governments may not be able to resist the lure of 'Net revenue. The administration vows to work with the World Trade Organization and the Organization for Economic Cooperation and Development to deal with foreign taxes and tariffs, but it will likely be years before agreements are hammered out in this area — if ever.

The report recommends that "states and local governments should cooperate to develop a uniform, simple approach to the taxation of electronic commerce." But that's vague and doesn't spell out what the feds will actually do to ensure cooperation.

The administration also has major work to do internationally and domestically on intellectual property issues such as copyright and trademark protection, and its policies on the export of encryption technologies and public key escrow still rankle industry leaders.

Like the stalled telecommunications reform effort, the electronic commerce policy looks good on paper. But expect a devil of a time with the details.

John Gallant, editor in chief

jgallant@nww.com

Desktop Collaboration • Christine Perey

If it plays nice, Microsoft can jump-start desktop conferencing

With its NetMeeting 2.0 conferencing software, Microsoft has the opportunity to make the shift from industry dominator to industry collaborator.

If the company can incorporate feedback from others using or building H.323-based products, Microsoft will deliver the missing keys to the collaboration and conferencing market.

NetMeeting 2.0, released in April and available on Microsoft's Website, is a robust audio, data and videoconferencing application. NetMeeting 1.0, its T.120-based data-conferencing precursor, was released with Internet Explorer 3.0 last August. Both versions have consistently earned glowing reports from users and reviewers.

All this attention on conferencing is effectively jump-starting a market that has terrific potential but has been glacially slow to take off: desktop collaboration. In NetMeeting, Microsoft has what appears to be the keys needed to drive the real-time collaboration and conferencing market.

With the free software on their clients, project teams can turn concept into reality, creating solid applications for collaborative technologies more quickly and concretely than was possible in the past. They can get into the vehicle and start the collaborative engine. Good deal! Right?

Maybe. The first rule of collaboration states that the quality of the total end-to-end experience is only as good as the weakest link among the distributed entities that want to work together. User satisfaction will depend heavily on the intelligence of the network and its ability to support audio and video streams without interruption or latency, deliver network-independent direct inward dialing, and transfer, hold and conference a party as well as control the bandwidth per segment and in the backbone.

NetMeeting 2.0 cannot deliver bandwidth where it doesn't exist. It is not a network management tool, either. Microsoft must work with network component vendors to build and deliver a whole solution: an H.323-compliant network, including the client application and management layers.

Realizing this, strategists in Microsoft's NetMeeting unit have made an effort to reach out and seem willing to license their redistrib-

utable components to all comers, free of charge. This lets vendors tightly integrate NetMeeting into any audio-, data- or videoconferencing product, while building upon and adding value to the platform.

Microsoft does not and probably will not own the network the way it owns the PC, so it must collaborate with other vendors. While experimenting with this concept through participation in standards bodies and industry associations, the company is providing a valuable service to those who envision collaboration as a strategic tool: Microsoft is supporting an intelligent client at the right price.

People were waiting for a solid tool that would run on a base platform and for which they can purchase accelerators such as PictureTel's LiveLAN 3.0. With NetMeeting, they have this basic tool.

For the collaborative application infrastructure to develop quickly, Microsoft will need to learn how to team up with companies it can't dominate. Everyone who has real-world applications for business collaboration technologies should take it upon themselves to help Microsoft collaborate with its partners.

Provide frequent feedback and introduce your key vendors to NetMeeting so they can make their needs known to NetMeeting's architects.

Most importantly, remind Microsoft that it has control over only a piece — the client — of the whole H.323-compliant solution users must have to be successful.

Perey is principal of Perey Communications & Consulting, a multimedia communications research firm in Placerville, Calif. She can be reached at (916) 621-0468 or via the Internet at cperey@perey.com.

MESSAGE QUEUE

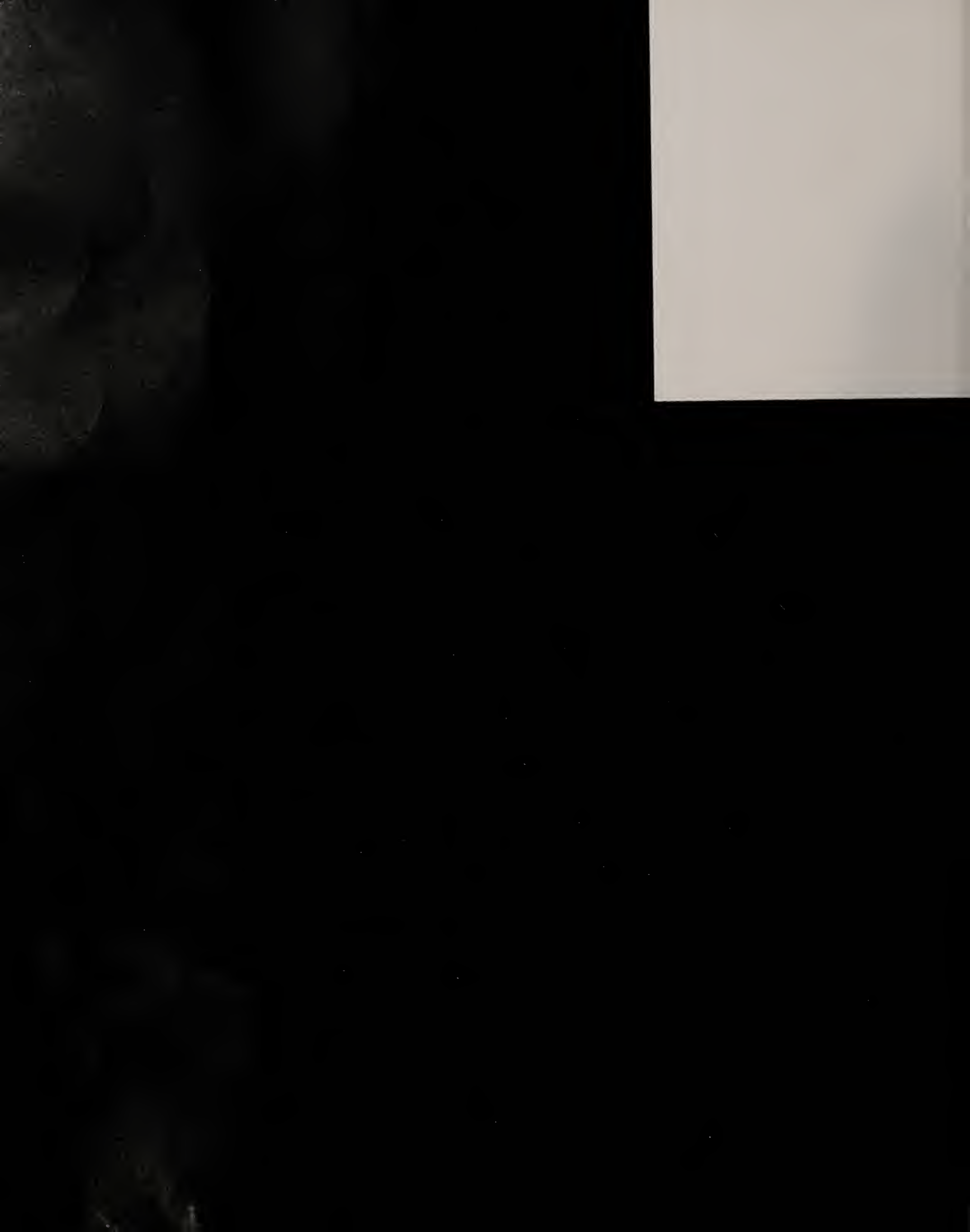
Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

All wet

I found your article "Are telcos soaking you?" (June 9, page 1) to be sloppy and sensational, especially in comparison to the much more thoughtful company column by Scott Bradner (June 9, page 42). Bradner has a much clearer grasp of the business realities within the telcos, where the cost of fiber is only one component of a complex business. The cover article, on the other hand, panders to those who love a good conspiracy theory.

The new, dense wavelength transport technologies have become available only in the past two years, and





Get me to the kiosk on time

NetWorld+Interop 97 Las Vegas. The networking show of the year. The main marketing melee for most of the world's finest network hardware and software companies.

My company's technology partner, Remedy Corp., provides the help desk workflow software for show operations as well as staffs a booth. This year, Remedy invited five partner/channel members to man kiosks at their booth. I was invited to do my firm's demos.

This story is about the extraordinary experience I had making it to the kiosk.

Monday, May 5 — 5 p.m.

My flight is set to leave San Jose, Calif., at 6:30 p.m. When I arrive at the gate, the pleasant but clearly stressed attendant begins pitching me on taking a later flight routed through Reno, Nev., because this one is overbooked. I am not interested, and besides, I have a confirmed aisle seat.

To my horror, I am informed I actually have a middle seat, and I have to check my carry-on bag at the gate because the overhead bins are already full. So while plotting the kidnap and torture of my travel agent, I reluctantly board the aircraft. I reach Row 22, and I am greeted by two substantial gentlemen who are less-than-thrilled to have me as their middle seatmate. I sit, arms tightly crossed, and reassure myself things can only get better.

8:45 p.m.

Off to catch a quick cab to the legendary Sahara hotel. I hit the sidewalk and see 200 or more Interopers waiting for taxis. With a heavy sigh, I get in line and wait 65 minutes for a cab. And this time, I really assure myself that things can only get better.

But...

Evidently, the new, larger Vegas venues have pressured the Sahara owners to begin a major face-lift. Yellow warning tape and makeshift signs litter the walls and walkways of the lobby. My 11th-floor room has cigarette and iron burns in the carpet, plastic cups in the bathroom and no pay-per-view. But it has a bed, electricity and running water, so I plug in my laptop, buy a soda down the hall and fire up the product I will be demoing the next morning. Everything is working great... until 1:20 a.m. Hotel power goes dead. Nada. Dark. Like, nothing.

I call the front desk. I am told that the power and water are being cut off tonight from 1 a.m. to 4 a.m. because of the renovations and that I should have received a memo under my door informing me of this.

No memo. No reason to stay awake. Time to end this day. Because, I assure myself, things can only get better.

Tuesday, May 6 — 8 a.m.

I snooze 'till 8 a.m., then get up and head for the shower. No water. Nada. Like, nothing.

I call the front desk and am told that there's a "slight problem": The water hasn't come back on in much of the hotel. However, if I come down to the front desk, I'll be given a key to a vacant room in which there is water so I may shower.

I get the key and head up to the 9th floor. I open the door and find two unhappy guests sitting on the beds, waiting for yet another guest to finish bathing.

I take my place in line, and we all watch Good Morning America in silence. And I am truly starting to believe things will *never* get better.

9:10 a.m.

I'm finally through the shower gauntlet and headed for the shuttle. I'm supposed to be at the show by 9:30 a.m., but I figure I have time because I'm only three blocks away. I settle into a seat, thinking maybe things will start to get better after all... Not.

The shuttle driver is unsure of the exact route and traffic pattern necessary to navigate through the police barricades and circles the entire convention center three times, ignoring our pleas to let us off anywhere. He finally kicks us out two blocks from the show. My hotel was three blocks. I could have walked on my knees and gotten there faster.

9:35 a.m.

I reach the badging area and ask an obviously temporarily hired operative wearing a green "Ask Me" hat to point me to exhibitor registration. So into the line from hell I go. The Jurassic era moved faster than this line. I can't understand it because there are literally dozens of empty computer-aided check-in stations. And then I hear it:

"The network is down." For registration at NetWorld+Interop. The largest networking show of the year. I just smile.

I make it to the kiosk at 10:14 a.m. The rest of the week is smooth sailing. My demo never crashes, the water and power are back on at my hotel that night and they even comp me for the first night's room rate. And as I fly home, I entertain a district manager from *Network World* with my story and, between belly laughs, she suggests I write it up and send it in for possible publication.

So I do it. Because I figure if I actually take the time to write it all down, maybe someone back home will believe me.

Campbell works in sales development at BayStone Software in Saratoga, Calif. He can be reached via the Internet at bcampbell@baystone.com.



many are not yet robust enough for network usage. Deploying them costs billions for a large telco. The new technologies realize their theoretical benefit only when they are fully utilized, which takes months or even years to realize. In the meantime, they depreciate rapidly. How does a telco caught in this cash flow bind pass on savings?

Curt Luze, district manager
AT&T
Middletown, N.J.

The article's authors, Denise Pappalardo and David Rohde, respond: This is exactly the point made in the article. Because of the huge cost of public-network infrastructure, the near impossibility of forklift overhauls and accounting and regulatory anomalies, PC industry-style price/performance improvements are not

being realized.

Unfortunately, your caveats about wavelength division multiplexing do not match the industry's hype. In fact, AT&T Chairman Robert Allen recently said the telecom industry is doubling its capacity every 12 months, boasting that this is faster than the typical doubling of computer processing power every 18 months.

Career health

Frank Schoff's article "It's time to check your career's vital signs" (June 9, page 63) was great. All too often, we don't stop to consider where we are or where we're going because our work and family lives are so busy.

In his book, *We Are All Self-Employed*, Cliff Hakim writes that we all have two jobs: the one we get paid for and managing our own careers. The book echoes much of what the article states in

terms of proactively examining your values, goals and skills.

Mike Robinson
Bedminster, N.J.

Big boys benefit

In his opinion column "Hundt's departure signals start of a new era for FCC" (June 16, page 46), Alan Pearce laments that "perhaps the most puzzling policy paradox that must be resolved is why industry consolidation is outpacing competition."

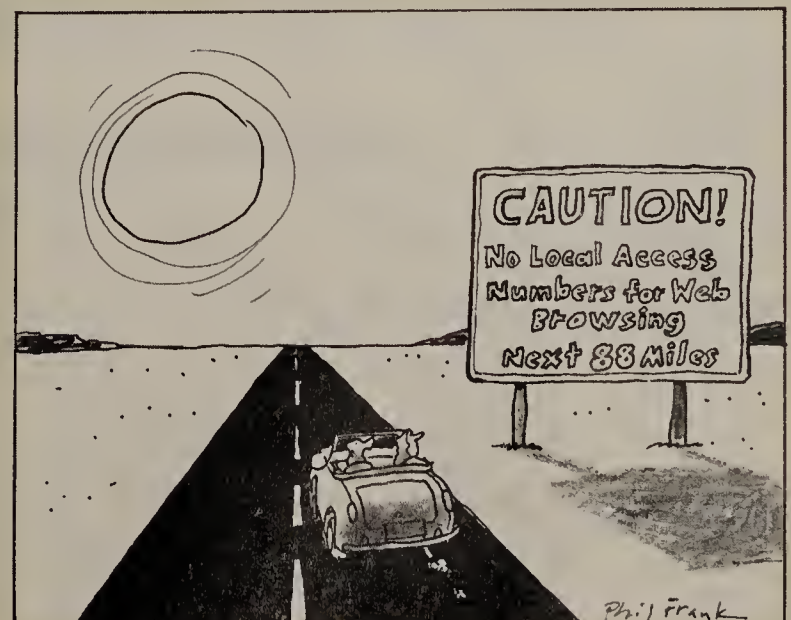
Pearce solves his own puzzle two paragraphs earlier when he notes that "Hundt won't be gone forever. He will be back in the fray in the year 2000 to work on the presidential campaign of close friend Al Gore." If nothing else, this administration—including the vice president—has proved that money talks when it comes to making policy.

And the bigger the player, the louder the message. When it comes to the FCC, the "big boys" have made out like bandits at the expense of smaller players

and a more competitive marketplace for consumers.

William Russell, president
William Russell & Associates, Inc.
Alexandria, Va.

Teletoons



Phil Frank and Joe Troise/Baba@siggate.com



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in complete security; that a group of telecommuters can accomplish a productive day of work without ever leaving their homes.

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Staying the course

It seems mind-boggling, but most companies do not — cannot — adequately plan how they will support new business applications being rolled out on their networks. Conducting a needs analysis to determine what networking resources are on hand, how they affect each other and what might need to be changed or added to support new goals falls outside the business processes of most organizations.

Proper needs assessment would spare the mess and wasted assets that result when projects fall apart. But it doesn't happen often. Instead, there's a revolving scenario that defies the team-management principles with which modern business practice is supposedly imbued. New applications and entire new business plans are piled onto a network until it breaks. Beepers go off and the smoke rises — the network is down, it has to be fixed. Money gets thrown at it and the next round begins.

There's the case of an IBM mainframe shop that rolled out a document imaging system over a NetWare LAN for \$250,000, or so it thought. Several unexpected server upgrades, backbone expansions and WAN bandwidth boosts later, the implementation cost an additional \$340,000. Factor in considerable network downtime, and it's hard to account for such an obvious planning blunder.

There is a better way, but it's not simple — it costs more up front than most operating budgets allow, and its success requires the efforts of a truly unified team. Conducting a needs assessment is an acid test for networking professionals. It's ultimately a business reengineering task that convinces senior management and

**A PROPER
NEEDS
ASSESSMENT
IS THE FIRST
STEP TOWARD
ENSURING
YOUR NEXT
PROJECT STAYS
ON TRACK.**

By Michael Csenger

sites that employ robust network management tools often lack accompanying business processes for carefully managing capacity expansion. "Instead, there's a lot of running around with screwdrivers to fix the squeaky wheel," Kennedy says.

Network consultants, integrators and the more candid net managers all echo the same theme: Real needs assessment doesn't happen because network planning is conducted under heavy fire when the infrastructure fails. "That's about 80% of our business," says Alan Weingarten, a network consultant with Digital's Digital Services Division in Albuquerque, N.M. "Companies call

other department heads to come to grips with networking's role in the enterprise.

Although regarded as a vital asset, networking is still budgeted as a back-office expense. Networks are expected to perform and continually improve through the wonders of technology that boards of directors read about in magazines. "They go to a party and hear about frame relay, and that's all they know," says John McClelland, senior network consultant with Digital Equipment Corp.'s Operations Management Services in Colorado Springs. "People in business do not understand the technology, so we see bandwidth increases of 30% to 50% being met with budget increases of 3% to 5%."

Even companies that have the technology in hand aren't mastering it well, says Michael Kennedy, director of consulting services at Strategic Networks Consulting, Inc., in Rockland, Mass. For example,



us in to help figure out why their network just broke."

Unless they're embarking on a technology migration large enough to grab everyone's attention, companies rarely assess their requirements and plan ahead. Networks can be healed, but entire projects fail and die as a result of this poor planning.

Each undertaking is as different as the business factors driving it, but following some basic steps can get you through the needs assessment process.



Brace yourself in mind and budget for the fact that half of the work of a needs assessment consists of groundwork and preparation, not

actual assessing. Establishing clear goals and compiling a technology baseline are crucial, but mammoth, tasks when organizations lack the framework for such discussions.

The real labor goes into establishing the lines of communication and determining what the project needs to accomplish. Figuring out the technology requirements for new applications will be grunt work in comparison. The bits and bytes can be delegated — shepherding the overall process is the real crux.

The people running large, well-oiled shops inhale sharply when asked for general guidelines on how to conduct a needs assessment.

"There are no simple rules of thumb that you can boil this down to," says Jerry Krause, director of network services for United Airline, Inc.'s Apollo Travel Services. "There are whole books written on the subject of developing business proposals. It's a matter of keeping communications clear and open at every level and at every phase of the project."

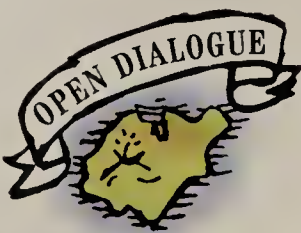
An attitude adjustment is required — you must accept the fact that even though you're the network manager, you probably will not gain control of how the network is used. This dawning recognition has already led to a strategy of overbuilding campus networks whenever possible to accommodate at least the next round of traffic.

Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., recently led a seminar during which he asked a room full of network managers if they had any control over the applications being run across their networks. "These are large organizations with enough forethought to at least send their people to seminars, yet the response was less than one out of a hundred," Nolle says.

One manager of a \$1 million-plus network budget admits, "I don't even know what's running over my network. All I see is more traf-

fic, and I try to stay on top of the curve."

LAN switching is welcomed because it's cheap enough per port to make reserve capacity more affordable, Nolle says. "Networking people have now realized that the business people really will go ahead with a project that breaks the network. So they're building forward just as far as cost-justification can allow, enough to absorb that next project and prepare a new business case when the reserves are drained."



Forward-planning is an expensive process that requires new tools and expertise.

Be prepared to explain the potential benefits

and return on investment to senior management to get a needs assessment off the ground. A full-blown consulting contract that starts with strategic planning and stops just short of a request for proposal can range from \$150,000 to \$500,000. More affordable outtasking relations that help with key parts of the process start at \$10,000 to \$20,000, but will rise to more than six figures for larger networks. Work conducted entirely in-house will cost less because profit won't be factored into the figures.

"In senior management's mind, you're going to spend a lot of money on the network and not be able to do anything more with it than what they already see," Krause says. "That's the disconnect: In their minds, you still have all the same applications, the same PCs, so they see nothing you've done to improve the business. You have to convince the CEO that there is, in fact, a payback — that you're creating the potential for new capabilities or improving current capabilities so there'll be less downtime. You present a business case and speak purely in those terms."

"The most broken environments we've seen have very little communication going on between the technology people and the business people, which is why they're in the mess they're in," McClelland says. Needs assessment will often arise in an atmosphere of stress and denial, and this finger-point-

WHY PROJECTS FAIL

CIMI Corp. surveyed 267 shops last fall that implemented or embarked on a total of 1,370 long-term projects from 1990 to 1995. Of these, only 475 were deemed a complete success. Most were a compromise of success and snags, while 125 projects failed completely.

Of the 125 failures, here's a breakdown of what went wrong (multiple answers were permitted):

124: Bought the wrong thing Often the right technology but the wrong products or features.

80: Inadequate goals Project requirements were either incomplete or inaccurate (lack of communication).

49: Vendor misrepresentation or evasion Guilt by traps.

43: Lack of internal skills This is usually tied to inadequately defined goals.

40: Lack of external skills Network integrators, consultants or outtaskers bungled the job.

38: Shifting focus Despite warning signals, business goals shifted after the project launch.

Source: CIMI Corp., Voorhees, N.J.



Project failures were nearly twice as high when led by outside integrators or outsourcers than when conducted entirely in-house or led in-house with outtasking support.

BASELINING BASICS

Baselining unveils exactly how traffic flows through your network, although you need to know what to look for to discern what it means. A baselining rule of thumb is that 80% of the information is worth gathering. The last 20% is extremely difficult and expensive to pin down, and not cost-effective to pursue.

Metrics of baseline analysis include:

Accounting: Device inventory, bandwidth consumption by application, top users, busiest sites and busiest devices

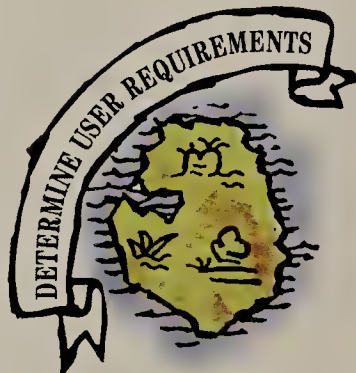
Configuration: MAC address/IP address/hub port mapping, topology, routing paths, switching paths; check Ethernet spanning tree configuration and token-ring source-route distribution to see whether correct paths are being followed in bridged networks

Performance: Device/link utilization, response time, error rate, collisions, packet drop rate, latency; assess relationship between bandwidth, frame size, loading and response; frame error counts provide a feel for the overall condition of network segments

Availability: Percent uptime, time to recover, time-between failure, interface resets rate, WAN link reliability

ing makes it that much more difficult to establish the dialogue that must begin.

McClelland offers some pointers. "You want to steer the conversation to where there's no blame being passed around. If you're in a meeting with the conflicting parties who triggered the problem, you don't ever want to push them to the point where they feel they have to defend what they've done in the past," he says. "I don't care how they've gotten to this point — we need to talk now about where to go."



Determining user requirements is a seemingly obvious step that's often left out because it just doesn't happen without effective communication.

It comes down to three questions: What is the network currently being used for? What are we trying to make it do? What future needs are anticipated?

Here, too, it gets political. "Getting people to work through these basic requirements and end-user goals is business process reengineering, and you have to treat it as such," says Glenn James, a partner with Deloitte & Touche Consulting Group in Atlanta. "The technology can be beat to fit the people better than the people can be beat to fit the technology."

That's a mantra that technologists easi-

ly lose among the details. People at the network level see their work in terms of IP and IPX traffic, not in terms of how much traffic is stemming from specific applications or processes, Kennedy says. Baselining tools exist for this sort of analysis, but they cough up enormous volumes of data.



Most organizations have no idea what's on their networks. Baselining will turn up servers, subnets and whole protocols that you had no idea existed.

Baselining is the first hands-on step of a needs assessment. It can be done in three ways — through a consultant, in-house using a turnkey solution or outsourced to a provider of baselining services. The key aspect is not to just inventory what's on the net, but to figure out exactly how different applications are consuming resources. This can be done in great detail, but not without a steep learning curve. Here's where outside help comes in.

First, network consultants and outtaskers can help break a communications impasse. They provide the baselining insight to offer a clear picture of network usage and trends. Finally, they serve the standard consulting role of helping define business goals and translate them into technical requirements and a viable business plan.

Baselining isn't cheap, but it's essential for capacity planning. Baselining tools use Remote Monitoring (RMON) 2 probes to gather Layer 3 data from devices across the network and require considerable expertise to implement and administer. Sites can run turnkey solutions in-house but usually will need a full-time administrator to update changes to the network over time. A baseline must be run over a period of at least three months to provide real trending data. The baseline offers even greater value when used as a full-time planning tool wedded to the overall network management system.

Concord Communications, Inc. of Marlborough,

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GET OUT YOUR CALCULATOR

As you prepare a needs assessment, it helps to establish exactly what your administrative budget covers and how a new systems rollout will impact it.

Here are some areas to consider:

- Installation and configuration
- Troubleshooting
- Maintenance and repairs
- Storage management
- Software distribution
- Security and virus protection
- Capacity planning
- Performance management
- Inventory and asset management
- Applications support
- Network operating system support
- User administration
- Cooperative training
- Travel time
- Overhead and general administration

Assessing the overall budget impact of new applications and services is another daunting task.

- Inventory the complete network infrastructure, including hardware, services and staff. Itemize ongoing expenses — both hardware and software:

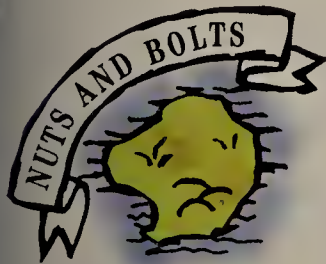
- Service/support contracts
- WAN costs
- Salaries
- Development/training

- Determine exactly what the service or applications will be, then budget for acquisition, implementation and support costs.

Mass., sells a turnkey package called Network Health, which can factor the cost basis for traffic from different applications. Concord and other vendors also partner with service providers and consultants who use the tools as part of their service package. International Network Services (INS) provides EnterprisePro (EPro), a Web-based tool that customers can use on their own or outsource through INS. Building on its own experience with turnkey solutions, INS crafted the outtasking service as a simpler alternative.

A baselining service such as EPro costs roughly \$2,000 to \$3,000 per month for a midsize corporation and can run as high as \$10,000 depending on network complexity. Concord's platform ranges from \$10,000 to \$30,000.

Whatever the choice, vendors, consultants and service providers point out these tools are complex and don't yield worthwhile results without considerable user training. Qualified feedback is essential.



With real numbers in hand and clear goals in mind, actual needs assessment now begins. Planners can gauge resources in

place and how they'll be affected by new traffic loads. Will servers be able to handle increased usage? Is the database up to snuff and will there be adequate backup for it?

Not to oversimplify, but this phase of the project is probably the easiest because it builds on the previous four and gets the network planner back on familiar technical ground.

"If you're trying to do something based on rational planning, when you arrive at this point, you'll be able to do it successfully," Nolle says. "Getting the skills to move forward is much less complicated than figuring out where you want to go."

Other consultants agree but warn that the job is still far from over. "Customers usually understand the limits of their database engines and applications servers," McClelland says. "What they don't understand is the impact on the strings that tie it all together — there are a lot more systems analysts out there than network analysts."

There is no codified plan for figuring out specific needs and implementing their execution, McClelland says. "It's a matter of common sense and flexibility. You need to be astute enough to see problems happening and then have the knowledge to figure out why."

Much of the planning at this point happens on whiteboards and paper. Network modeling tools can help, but like baselining tools, these require considerable expertise to be used effectively. "You're better off doing it by hand," McClelland says, although others disagree, saying that the ability to model network permutations and different traffic characteristics is key to understanding what future problems to expect and how much they'll cost to fix.



A needs assessment that arrives at this point would more than satisfy most network planners. But some projects will benefit from or absolutely

require further detailed prototyping.

This is often the most important aspect of planning, according to Nolle. "The application has to be trialed by the people who are going to use it — nothing else will cement the connection between users and their technology."

This need for hands-on feedback is the main reason why shrink-wrapped software and low-performance database programs are often pressed into service. "In the '80s

Go online for needs assessment help from the experts:

- ▶ Digital Equipment Corp. Network and Systems Integration Services' overview of the assessment process and case study recommendations and tips for managing the costs and complexities of communications
- ▶ Strategic Networks Consulting's paper on baselining
- ▶ Demo of International Network Services' EnterprisePro net performance monitoring tool
- ▶ Archive for comp.dcom.net-management newsgroup and network management and analysis references
- ▶ Gartner Group's perspective on overall technology planning

www.nwfusion.com



and early '90s, users got fed up with big, custom projects because they had no idea how the solution would fit them until a massive part of the undertaking was already done," Nolle says. "People couldn't communicate their needs effectively enough to get projects launched in the right direction. You still have to guard against that happening."



Marshaling the support and resources for what ideally should have been a straightforward business analysis is not an opportunity to squander. This is the time to establish clear-cut responsibility and obligations for networking assets across the organization.

"It's time for the dreaded 'Thou Shalt Not' document," Weingarten says. "You need to establish centralized procedures for basic things like administering IP addresses. It doesn't have to be all that rigid, you just need to document basic security and administrative procedures, or you'll be starting all over again before you know it. With switches today, you really want to keep gurus down the hall from

hooking up their neighbors, and that means you'd better meet your obligation to support those needs."

Better days ahead?

As networking gets more sophisticated, it becomes easier to plan ahead, Weingarten says. "Years ago, you just kept daisy-chaining until it quit, but today, this technology is so well spec'ed out that if you build an infrastructure to support established standards, you can pretty flexibly change the details over time." Ethernet, for example, offers clear migration paths. So does ATM.

But the vast majority of network shops are just coming to grips with frame relay, and future trends can be as confusing as always. Compounding the technical environment are business factors such as mergers, acquisitions and continued downsizing. Today's warped disregard for technology planning stems in part from the ensuing confusion, no doubt, which ought to drive home one salient point: Net managers who speak technology and business well enough to plead the case for a needs assessment will arrive at healthier surroundings than those who don't.

Csenger is a freelance writer based in the Chicago area. He can be contacted at mcsenger@mcs.net.

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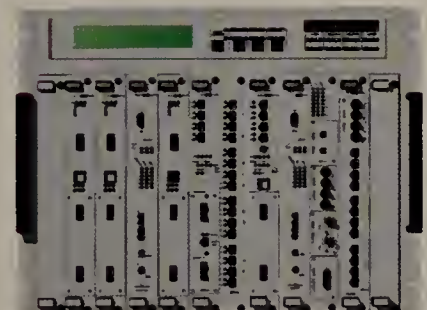
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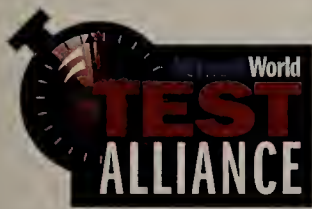
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Encryption grows up

These five packages, led by Entrust/ICE, inflate the case to encrypt.

By Stephen Cobb

Hacked systems. Stolen laptops. Secrets sold by disgruntled employees. You've turned to firewalls, electronic locks, passwords and ID cards for protection against these threats. But your job isn't done if you're not encrypting sensitive data.

Encryption, which renders data unintelligible to anyone but the person holding the correct descrambler key, is rapidly becoming your best hope for keeping secrets secret. In fact, the five products we looked at, ranging from offerings best-suited for single systems to packages that scale up to the enterprise, show that you no longer have as many excuses for keeping encryption out of your bag of security tricks.

Our review shows that Entrust Technologies, Inc.'s Entrust/Integrated Cryptographic Engine (ICE) is your best bet for enterprise security, which is why it received Blue Ribbon honors. The package encrypts and authenticates files and e-mail and gives you the option for more industrial-strength protection, including hardware tokens.

Symantec Corp.'s Norton Your Eyes Only (YEO) has grown into a comprehensive, mature and full-featured package that comes in single-user and network versions. RSA Data Security, Inc.'s SecurPC is a solid package that now has network support, while McAfee Associates, Inc.'s PCCrypto supports self-extracting encrypted files but encrypts archives instead of files or folders.

Finally, Querissoft, Inc.'s fledgling SecureFile uses digital certificate technology to authenticate senders and receivers. The package's tight integration with Microsoft products, which have been criticized in the cryptographic community, has negative and positive implications.

One negative that applies to all the products is that they cannot talk to each other, which means anyone getting an encrypted file from you will need the same package to decrypt it, unless your program creates self-extracting encrypted files that can be opened by entering the correct password. This situation will not change until there is wider implementation of emerging standards such as Secure/Multi-purpose Internet Mail Extensions, IPSec, Internet Security Association & Key Management Protocol and Secure/WAN.

Entrust in public-key infrastructure

Entrust/ICE is suitable for the enterprise because it ties desktops and laptops into the higher level Entrust and Entrust/Lite public-key infrastructures and uses pioneering digital certificate technology developed at Northern Telecom, Inc., Entrust Technologies' parent. Entrust/ICE automatically encrypts documents that have a digital signature, a unique numeric identifier that enables you to verify the identity of parties in electronic transactions.

The package also automatically encrypts the contents of designated folders using any one of an impressive range of encryption schemes, including Nortel's propri-

etary Carlisle Adams and Stafford Tavares algorithm (CAST), the Data Encryption Standard, Triple-DES and RSA's RC2. You can limit access to encrypted folders to yourself or anyone on a list of recipients verified by their digital signatures. Entrust/ICE also can automatically encrypt selected files at system shutdown and decrypt them at start-up.

Entrust/ICE is well integrated with Windows 95 and NT 4.0, but requires you to license at least Entrust/Lite. When we looked at Entrust/Lite last year (NW, March 11, 1996, page 57), we said it delivered a full range of high-speed encryption, authentication and verification services in a single application that is relatively easy to install and administer. Only one Entrust logon is required to access the combined encryption and file-signing features of both products.

For your eyes only

If Entrust/ICE is suited for the enterprise, Symantec's Norton YEO extends a single-

user file protection and access control utility to smaller networks.

In addition to file encryption, YEO offers a BootLock feature, which encrypts your system information to prevent intruders from accessing your hard disk. While it offers powerful protection, BootLock can render your hard drive inaccessible if something goes wrong. We strongly recommend you create an Emergency Unlock disk for insurance.

Like three of the other programs we looked at — McAfee's PCCrypto being the exception — YEO adds encryption commands to the Windows 95 or NT Explorer pop-up menu. However, YEO takes the extra step of adding an icon to the task bar for accessing the YEO Command Center, which is where you configure every aspect of data access on your PC. You can select RC4, RC5, Blowfish and Triple-DES to encrypt files, and there is an exhaustive set of password rules. The public- and private-key sizes can be set anywhere from 256 to an impressive 2,048 bits.

Any files put in a designated YEO SmartLock folder are decrypted when opened and encrypted when closed by



ScoreCard

	Entrust/ICE	Norton Your Eyes Only	SecurPC	PCCrypto	SecureFile
Overall score	7.9	7.6	7.4	6.6	6.2
Features (20%)	8	8	8	7	6
Manageability (20%)	8	8	7	6	6
Ease of use (20%)	8	7	7	6	6
Performance (15%)	8	7	7	6	6
Encryption strength (15%)	8	8	8	8	7
Installation (5%)	7	7	7	7	6
Documentation (5%)	7	8	8	7	7

Scores are based on a scale of 1-10. Percentages are the weight given each category in determining the overall score.

NetResults

Product	Entrust/ICE 1.0	Norton Your Eyes Only 4.0	SecurPC 1.1	PCCrypto 1.0.1	SecureFile Release Candidate 1.0
Vendor	Entrust Technologies, Inc. (703) 712-8222 www.entrust.com/icehome.htm	Symantec Corp. (408) 253-9600 www.symantec.com/yeo	RSA Data Security, Inc. (415) 595-8782 www.rsa.com/rsa/products	McAfee Associates, Inc. (408) 988-3832 www.mcafee.com	Querissoft, Inc. (404) 812-6272 www.querissoft.com
Price	\$49 per user plus \$50-\$75 for Entrust/Lite	\$89.95 for single-user version \$799 for 10-user version	\$129 for single-user version	\$49 for single-user version	Pricing not yet announced
Pros	<ul style="list-style-type: none"> ▲ Good use of digital certificates ▲ Scales across the enterprise ▲ Encrypts e-mail ▲ Good management tools and selection of algorithms 	<ul style="list-style-type: none"> ▲ Good administration tools ▲ Good choice of algorithms ▲ Nice boot protection and screen saver features 	<ul style="list-style-type: none"> ▲ Creates self-extracting encrypted files ▲ Emergency recovery capability ▲ Good automatic encryption 	<ul style="list-style-type: none"> ▲ Creates self-extracting encrypted files ▲ Provides strong algorithms ▲ Powerful wipe file feature 	<ul style="list-style-type: none"> ▲ Wide choice of algorithms ▲ Good user interface
Cons	<ul style="list-style-type: none"> ▼ Requires significant initial investment ▼ Cannot export files to non-Entrust users 	<ul style="list-style-type: none"> ▼ Requires significant initial investment ▼ Does not create self-extracting encrypted files 	<ul style="list-style-type: none"> ▼ Bland interface ▼ Somewhat expensive 	<ul style="list-style-type: none"> ▼ Uses encrypted archives instead of files and folders ▼ Not accessible from Microsoft's Internet Explorer 	<ul style="list-style-type: none"> ▼ Not shipping yet ▼ Requires Internet Explorer 3.02 or greater

authorized users. The plain text copy of an encrypted file is automatically deleted, and you also have the option to wipe ordinary files from your disk with YEO's Secure Delete File command. SmartLock folders don't encrypt program files, though this can be done manually.

We had mixed feelings about the fact that SmartLock folders do not display an icon that's different from regular icons. This might add a certain amount of security-by-obscure, but authorized users might like to see at a glance which folders are encrypted, instead of having to open the Properties dialog box to check.

Other nice touches in YEO are a hotkey-activated, password-protected screen saver and the ability to customize the user logon message.

YEO also offers useful features for multiple user and networked PCs. If other people use your computer, you can add them as secondary or guest users, varying the amount of access they have to your hard disk and connected network drives.

A YEO Administrator version enables you to manage encryption across an entire network. You can create users, set their rights and selectively turn on or off all options from a single console. You can define users in groups with a set of options and rights based on that group and configure password rules for everyone. When users forget their password, you can assign them a one-time password.

Furthermore, YEO Administrator lets you set a "superuser" password, which gives you the ability to override ordinary passwords. This helps avoid a data-ransoming situation in which someone tells you to pay up or you won't get the password protecting access to an important-but-encrypted file.

YEO Administrator also distributes pre-configured user modules and any updates or configuration changes, which are in-

stalled when users log on. An agent at each workstation uploads audit logs to the console so you can monitor all security-related activities.

RSA: The Microsoft of security

Where Symantec's YEO is an extension to its traditional line of system protection utilities, RSA's SecurPC is an end-user version of the technology licensed to makers of everything from operating systems to Web browsers.

SecurPC encrypts files and folders on hard drives, diskettes and network drives. Before encrypting selected files, you are asked for your password, which can be kept

in RAM to avoid repetitive re-entering. However, that comes at the risk of enabling an interloper to de-encrypt files if you leave your system unattended and unlocked.

An encrypted file is given the extension .!!! with the original extension added to the file name in brackets. You use the AutoCrypt List to automatically encrypt

and decrypt designated files and folders when you shut down or start up Windows. However, it would be useful if the AutoCrypt List enabled you to designate all files of a certain type for encryption.

While SecurPC won't encrypt executable or system files, it will create self-extracting encrypted files. This means the file can be sent to any Windows PC even if it isn't running SecurPC. However, Macintosh users need the version of SecurPC for their platform in order to use this feature.

To maximize performance, SecurPC uses RC4, a fast stream cipher. During setup, RC4 creates a secret key based on random mouse movements and keystrokes. The secret key is used with the user password to protect the randomly generated RC4 keys. As a safety measure, network administrators can recover encrypted files if a user's password or userpref.!!! file is lost or unavailable. An Emergency Access feature creates an emergency key that can be split into parts, each held by a different person. A minimum threshold number of key parts is then required to decrypt a user's files. Administrators also can verify who encrypted the files.

Spreading out from viruses

As RSA attempts to crack into the end-user market, McAfee is repositioning itself as a security management company. Long synonymous with antivirus software, McAfee offers its PCCrypto software as a stand-alone product or part of its VirusScan Security Suite — formerly the Desktop Security Suite — a collection of security programs that includes a virus scanner, data backup tool, network traffic encrypter and PC firewall. McAfee recently announced Version 2.10 of PCCrypto, but we could not get it into the lab before press time. The new version, however, does not appear to be substantially different from the one we reviewed.

PCCrypto places files within encrypted archives with a .ENC extension instead of encrypting files or folders. These archives also can be converted to self-extracting files.

During installation, a program group is created on the Windows Start menu and PCCrypto is accessed from there. When running PCCrypto, you can open Windows Explorer's Select Files dialog box. You can use multiselect to add files, but you can't use wildcards or add folders. Unfortunately, there are no file types in the Files of Type dialog box. However, you can encrypt the contents of the Window's Clipboard and choose to use a 40-bit PC1 algorithm, a fast stream cipher or a 160-bit Blowfish algorithm.

You can also compress plain text before

encryption. The password to protect encrypted data can be up to 50 characters long and can include spaces, numbers and symbols.

Files in encrypted archives are displayed in a PCCrypto list box, allowing you to choose which ones you wish to decrypt. You're prompted for the password and warned if decrypting will overwrite an existing file. You can have details of PCCrypto operations along with your comments of up to 60 characters entered in a log file that is encrypted and password-protected. Finally, there is a facility on the wipe page to permanently erase data from your disk drive. Data that can be wiped includes disk files, file slack and free drive space, though you cannot use

The keys to encryption

Network administrators everywhere are familiarizing themselves with the language and terminology of encryption, which can be confusing at times.

For example, you might have read that traditional symmetric cryptosystems use private keys for encryption, but so-called public key cryptosystems also use private keys. This may seem confounding, but it is actually a very important distinction.

All of the products we reviewed use symmetric cryptosystems, which means the same key is used to encrypt and decrypt data. Obviously, to maintain the secrecy of encrypted data, this key must also be kept secret, hence the term "private key."

Symmetric cryptosystems use algorithms, such as the Data Encryption Standard (DES), which tend to be very efficient. These algorithms also can be very strong, only yielding when a massive amount of computing power is applied in what is termed a brute-force attack that keeps trying individual keys until the right one is found.

But with today's desktop computers rivaling the capacity of the first Cray Research, Inc. supercomputer, "massive" becomes a relative term. This is particularly true if you harness the power of multiple computers, which is exactly what happened in the recent, groundbreaking DES challenge. When RSA Data Security, Inc. offered \$10,000 to anyone who could read a DES-encrypted message, Rocke Verser of Loveland, Colo., wrote a brute-force program that was distributed across the Internet to thousands of volunteers who were given a list of keys to try. It took four months to find the right one.

The length of the private key in a symmetric encryption algorithm is a major factor in determining the amount of computing power required to complete

a successful brute-force attack while the encrypted data is still valuable. DES uses a 56-bit key. Because of U.S. government policy to hamper access to strong encryption, companies sell export versions of their programs that use 40-bit keys, which are now considered completely inadequate. Bear in mind that the length of time required to guess a key doubles for every extra bit in length.

One of the most helpful documents on this subject is "Minimal Key Lengths For Symmetric Ciphers." Written by some of today's best known cryptographers, the paper concludes that a minimum key length of 90 bits for symmetric cryptosystems will be needed to keep data protected over the next 20 years.

There is another type of encryption in widespread use today, known as asymmetric, or public key, encryption. These public keys are based on calculations that are hard to reverse, such as factoring the product of two large prime numbers. In practice, this means you can encrypt information with a matching pair of keys, one of which can be made public without compromising the encrypted data, while the other must be kept private.

Asymmetric encryption avoids the biggest problem of symmetric encryption, which is finding a secure way to divulge the key to the recipient of an encrypted file. However, because public key encryption uses so much complex math, tapping it to encrypt the contents of data files is impractical. Consequently, symmetric encryption is used to scramble bulk data with a key that is then encrypted with public key encryption.

Keys for asymmetric encryption need to be much longer than for symmetric ciphers, for example, 1,024 or 2,048 bits is not unusual.

— Stephen Cobb

Go online for:

- An overview of why you need to encrypt data
- Details on how collaboration across the Internet helped crack a Data Encryption Standard key
- Access to a white paper explaining why you should use a 90-bit encryption key to protect data over the next 20 years



HOW WE DID IT

A variety of files created by a mix of applications, including Microsoft Word and Excel, were encrypted and transferred across an Ethernet network from one PC to another. Encrypted files also were sent via e-mail to PCs on a different network. Once decrypted, files were checked to make sure they matched their originals.

We also examined each package for ease of installation and use, and looked for any obvious weaknesses in the security of each program's design without delving into a full-blown review of source code. In addition, we observed the speed of operation, but decided not to record file encryption/decryption times. We thought it would not be meaningful to compare products that use algorithms of differing strengths and, in some cases, were intended to serve different purposes.

the wipe function on network drives.

Tightest of Windows ties

Of all the products reviewed, Atlanta-based Querisoft's SecureFile has the tightest integration with Windows 95 and NT. Because the product is not yet generally available, we looked at SecureFile Release Candidate 1.0, which can be downloaded free from the company's Web site. The product primarily uses the RC4 algorithm — a 40-bit version for export and 128-bit version for domestic use — but also works with a variety of other cryptographic engines and algorithms. Like Entrust/ICE, SecureFile makes extensive use of digital signatures and certificates for authentication.

Once installed, SecureFile commands are accessed from the Windows Explorer where you can encrypt and sign files with your digital signature or encrypt files for decryption by any of the people whose certificate you have added to SecureFile.

The package can work with standard X.509 Version 3 certificates and store them in a convenient book. Currently, certificates are generated by SecureFile itself, but the package will support certificates issued by independent Certificate Authorities when they become available.

After a file has been encrypted, signed or both, SecureFile adds a .enr, .sgn or .sec extension. You can have the original file automatically deleted, but we were slightly uncomfortable that the program overwrites preexisting files without warning when an encrypted file of the same name is opened. You cannot encrypt folders using wildcards, but a handy wizard makes it relatively easy to secure files spread over different drives or folders. Only files on mapped network drives can be encrypted, as the wizard does not give you access to Windows' Network Neighborhood.

While SecureFile's tight integration with Windows is appealing in terms of ease of use, its reliance on Microsoft's CryptoAPI could be a drawback. In order to use SecureFile, you must install Microsoft Internet Explorer 3.02 or later because SecureFile uses several updated CryptoAPI Dynamic Link Libraries that are distributed

RFC

Request for Comment

How do you make sure your network is healthy? We're planning a look at network monitoring software in an upcoming issue – software that monitors response time across the network, sends alerts and creates historical data for trend analysis.

Send Test Center Director Lee Schlesinger (lschlesi@nww.com) your suggestions for products we should evaluate.

with Microsoft's free Internet browser.

The fact that workable solutions such as the five we examined are available is reducing your ability to argue against using encryption.

Using encryption as your last line of

defense against malicious intruders or misguided insiders makes a lot of sense in today's increasingly interconnected world, particularly when you factor in the fallibility of other security technologies. Not to mention that it could save a lot

more than your data.

Cobb is a certified IS security professional and head of Cobb Associates, an IT and security consultancy in Titusville, Fla. He can be reached at cobb@digital.net.

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Management Strategies

Covering: Budgeting, Staffing and Career Planning

Briefs

■ **QuickStart Technologies, Inc.** recently opened the doors of its **San Francisco** office. The new site provides training, consulting and staffing services for the **Microsoft BackOffice** suite of server applications.

The office is a Microsoft Authorized Technical Education Center that offers one-, three- and five-day courses on BackOffice components, including Exchange, Systems Management Server, SNA Server, Internet Information Server and SQL Server. Most courses run for five days and cost \$300 to \$375 per day.

© QuickStart: (800) 326-1044

■ **Online learning software developer ILINC**, of Troy, N.Y., is shipping **LearnLinc LAN/WAN 2.0** virtual classroom software for global IT training. The new software lets instructors launch an application that can be viewed on individual desktops. It includes a Web sync agent for updating training materials and collectively navigating Web sites.

In addition, a glimpse feature provides access to students' desktops; a text chat feature lets students send messages to the entire class or just to the instructor; and compressed PowerPoint presentations can be launched as Web documents.

The server license costs \$50,000 for 100 concurrent users. Each client license costs \$500.

© ILINC: (518) 283-8799

■ **LearningTree International** has added **Unix System and Network Security** to its security curriculum. The four-day, instructor-led course covers the vulnerabilities of the Unix operating system and strategies for plugging security holes.

The course will be rolled out at the Learning Tree Education Center in Washington, D.C., on Aug. 5 to 8; in Los Angeles on Aug. 19 to 22; and in New York Sept. 16 to 19. The cost is \$2,095.

© Learning Tree: (800) 843-8733

Traveling the road to management: Do you have the skills it takes to get there?

By Connie Sloane Brown

If you want to join the ranks of management, you must supplant your technical ability with a few essential qualities to get the promotion.

Service organization CGI Systems, Inc., of Malvern, Pa., recognizes management potential in employees that demonstrate leadership qualities. The company has 14 worldwide offices that provide networking services, infrastructure, client/server application development and management consulting.

Paul Theorgood took CGI's fast track to management. Now the company's national director of network technologies, Theorgood started with CGI as a Certified Novell Engineer and then obtained his Microsoft Certified Systems Engineer designation. Soon after, he joined the company's management ranks as an engagement manager, which required him to interact with customers and search for opportunities to recruit more consultants. Next came a stint as consulting manager for the core business networking group. Theorgood was promoted to Northeast manager when his boss left the company and recommended him for the job. The-

orgood assumed his present role of heading the company's network consulting practices a few months later.

Skills to put on your resume

Theorgood attributes his managerial success to his ability to seek opportunities to grow the business. He says factors that make good managers at CGI are communication skills, personality, flexibility and patience. It's also vital to get along well with others and make workers feel valued, particularly in businesses in which people are the primary resource.

He defines flexibility as the ability to work with different technical issues and staff personalities; working nights, weekends and holidays as needed; and considering employees' personal issues that could adversely affect the business if overlooked.

Patience and vision also are required qualifications. Theor-

good says when customers are demanding, "it's time to show them the benefits that consultants are offering them and make them feel important." He also cites the need to exercise honesty and integrity. For example, consultants that don't know the answers must communicate that and then learn them.

Most importantly, Theorgood says employees always must carry the CGI banner and look for opportunities that are good for the company.

Sequel Technology, an Internet management software vendor in Bellevue, Wash., looks for managers who understand the fundamentals of the competitive environment and can stay abreast of the constantly changing volume of information.

Albert Behr, vice president of product marketing, says good managers should possess six key skills: aggression to chart new territories; intelligence to think out of the box and use sound judgement; charisma to inspire and motivate people; a can-do attitude that never backs down from a challenge; and maturity to maintain focus and substantiate decisions.

"At the rate we move in this industry, there is very little room for error. But when you're wrong, you have to adjust quickly and move on," Behr says. "Leading by example is a quality that all employees who want to become part of a management team should have." Behr notes that future managers must also demonstrate the ability to understand others' rules and jobs.

Don't worry if you don't have all of these intrinsic qualities — managers must continue to train and hone their skills. Programs such as Boston University's (BU) Corporate Education Center (CEC) offer management development courses along with other corporate-structured learning.

Ed VanSickle, CEC's director of computer career programs, says many traditional academic programs fail to service vocational or workplace needs. For

IMPORTANT QUALITIES FOR MANAGERIAL SUCCESS

- ▶ Charisma
- ▶ Communication
- ▶ Flexibility
- ▶ Intelligence
- ▶ Leadership
- ▶ Patience
- ▶ Vision

example, "many employees don't know how to manage or run specific projects," he says. BU established its program to serve as a step between traditional academia and corporate America. The school's four-day seminars address corporate needs and train employees in a specific skill or area.

Van Sickle says you need to constantly update your skills and keep up with the hottest product knowledge to maintain a successful career track, regardless of your network career discipline.

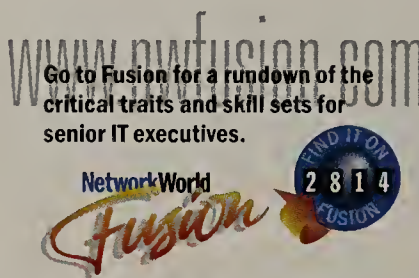
The need for training and education never diminishes, no matter how refined your management skills are. You must stay current with the industry whether you're a product user, vendor or service provider and whether you are focused on technology, customers or marketing techniques.

That fact isn't lost on the managers at CGI, who pay cash bonuses to employees for certification tracks they complete.

The monetary reward provides an added incentive for employees to obtain the training needed to advance their careers.

If you want to win a coveted management job, it also doesn't hurt to have a type "A" personality, be driven and have a passion for what you do. Above all, you need to demonstrate leadership skills and other attributes before you can occupy a corner office.

Brown is a freelance writer in Virginia Beach, Va. She can be reached at Cbrown1737@aol.com or (757) 631-9379.



NETWORK BOOK REPORT

Managing for Dummies

Bob Nelson and Peter Economy (Foster City, Calif., IDG Books Worldwide) 358 pp, \$19.99. Phone: (800) 762-2974; ISBN: 1-56884-858-7.

Management veterans and neophytes alike can glean plenty of useful tips from this guide to effectively managing people, projects and teams. Presented in seven fun sections, the book provides a thorough overview of developing, coaching and inspiring employees.

The meaty first section covers classic management principles, cutting-edge concepts, organization, delegation and leadership. The next area focuses on hiring, inspiring and coaching, while the third tackles measuring and monitoring performance. The fourth part is devoted to communication and teamwork; the next section addresses stress and discipline; and the sixth area is a payload of valuable management tools and techniques.

Head to the last section for Top 10 lists of common management mistakes, no-cost ways to recognize employees and classic business books you should have on your shelf.

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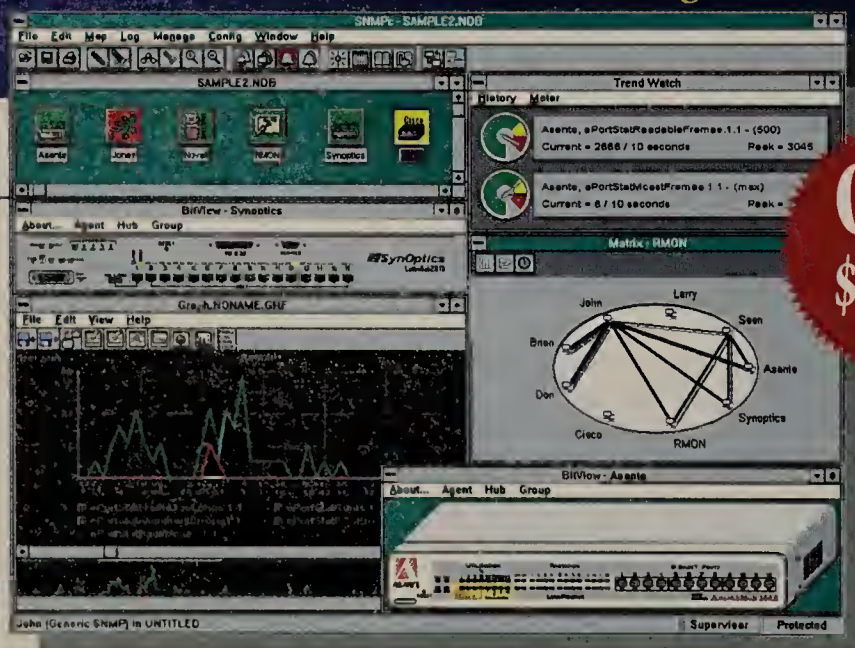
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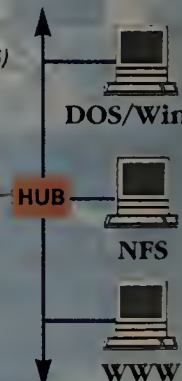


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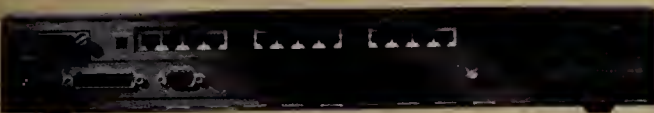
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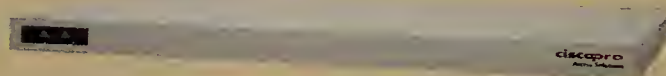
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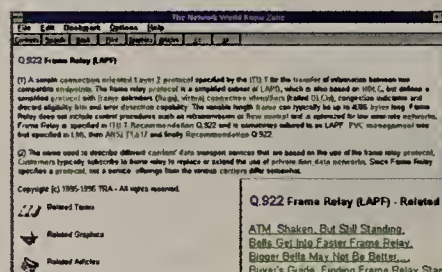
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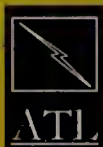
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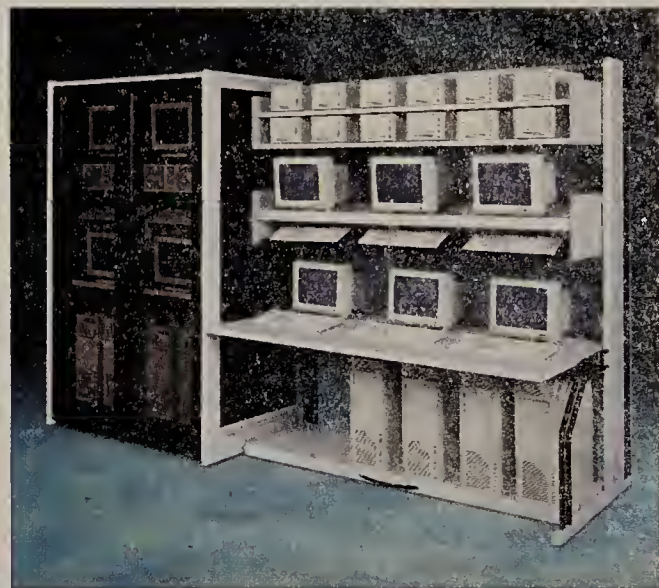


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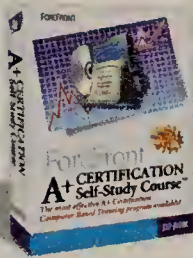
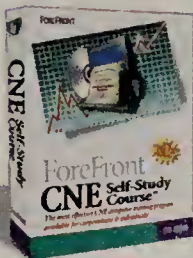
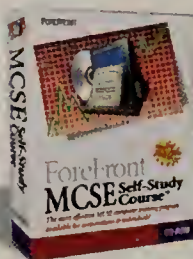


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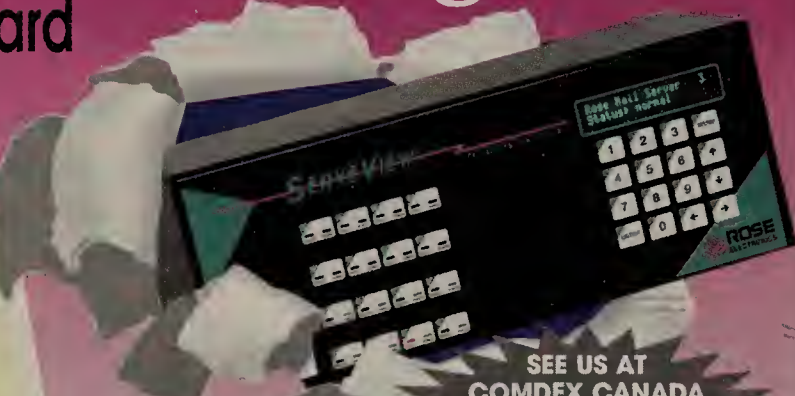
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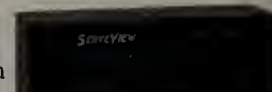
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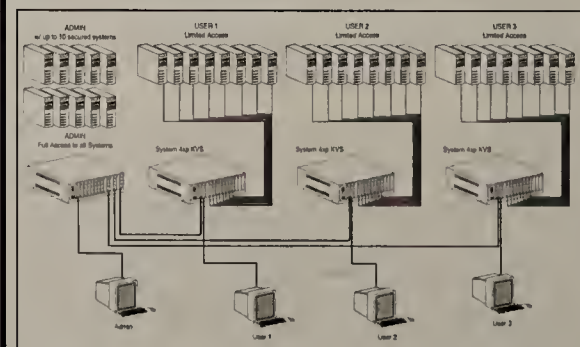


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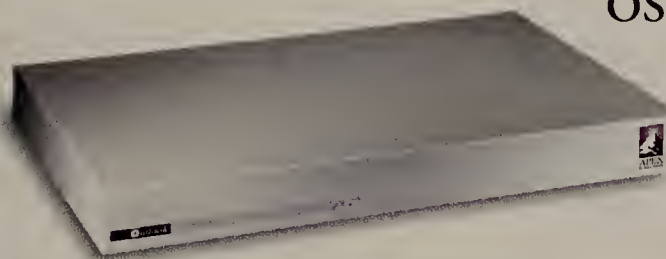
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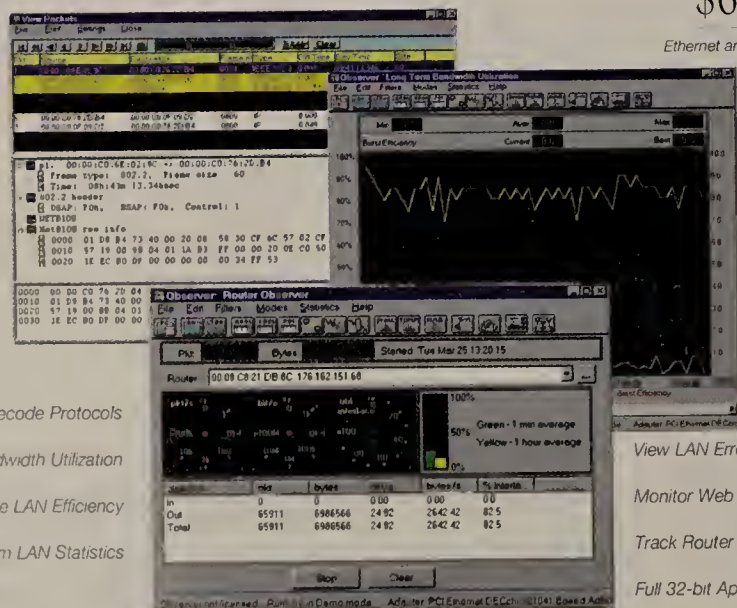
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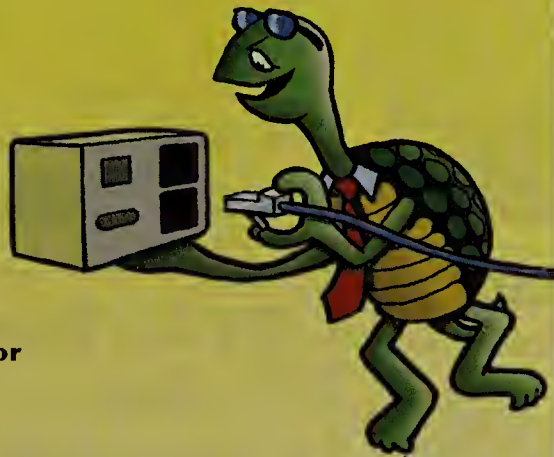
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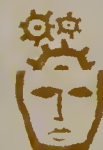
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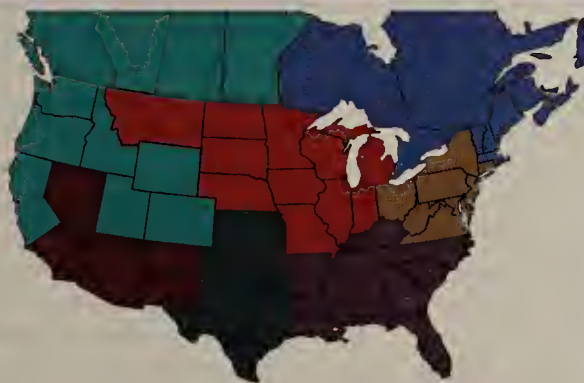
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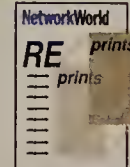
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FBI

Continued from page 1

This past May, for instance, Russian national Alexi Lashmanov pleaded guilty in federal court to assisting a Russian hacker who wormed his way into Citibank Corp. computers and transferred \$12 million to bank accounts in San Francisco, the Netherlands and Tel Aviv.

The alleged mastermind of the caper, Vladimir Levin, is awaiting extradition from a London jail. Three others previously have pleaded guilty to their roles in the scheme. FBI officials monitored the criminal activity online and recovered all but \$400,000 of the stolen funds.

More recently, FBI experts surfaced at the grisly California scene where members of the Heaven's Gate cult committed mass suicide. The bureau's Computer Analysis and Response Team (CART) carefully dug into the cult's computers in search of information about other cult members who might be planning suicides. CART is an offshoot of the FBI's laboratory. It specializes in forensic examination of computer gear and gathers evidence later analyzed by CITAC and field agents. CART personnel passed leads on to other law enforcement authorities.

These examples illustrate the effectiveness of the net the FBI is casting out to catch those involved in computer-related crimes and how the organization even thwarts crimes before they are committed. "We're ready now," says Geide, hunkered down over a conference table at the J. Edgar Hoover FBI headquarters in Washington, D.C. "The FBI is prepared to take on this issue.

Give us a chance."

Geide's CITAC unit, staffed by about 100 agents, was formed just eight months ago with the broad charter to protect the nation's critical computer infrastructure. Essentially, that means CITAC is looking at systemic weak spots in such areas as money transfers, the phone network, air traffic radar control, electric power grids and the flow of city water in major urban areas.

"There's a national security aspect to all of this," Geide says. "But beyond that, we're also after the criminal that uses computers or networks to perpetrate criminal acts on companies or the public." CITAC hunts for possible interrelationships between 'Net-related crimes,

that terrorists were at work. Tree limb were the actual culprit.

While CITAC is keeping one eye on national security threats, it has the other squarely on an increasing load of domestic attacks against businesses. It even can perform threat analysis, to protect private companies against long-term data or financial losses — provided they contact the FBI early about possible invasions.

A survey conducted by the FBI and the Computer Security Institute (CSI) this past spring found 75% of 563 information security experts at major companies reported financial losses stemming from computer security breaches. Such invasions ranged from financial fraud, theft of proprietary information and sabotage to damage done by computer viruses. Aggregate damages for the 249 companies that were able to quantify losses totaled more than \$100 million — and that's a conservative estimate, says CSI Director Patrice Rapalus. "A lot of companies don't even know they can report these crimes, and many don't realize they've been the victim of a computer attack," Rapalus says.

Some other chief findings of the survey:

- There was a 10% increase in the number of respondents who cite their Internet connection as a frequent point of attack.

- While 43% of respondents say they have been attacked from 1 to 5 times by outsiders, 45% don't know how many attacks they have experienced from outside the company.

- More than 60% of respondents do not have an internal computer emergency response team in place to deal with information attacks.

The most disturbing finding is that only 17% of the respondents say they would report attacks to law enforcement agencies.

"When businesses don't come to us, we lose valuable leads as well as the opportunity to learn how these groups operate," says Charles Owens, chief of the FBI's Financial Crimes section.

CSI's Rapalus says companies choose to conceal network attacks out of embarrassment or concern about negative public-

ity. Citibank, for instance, didn't bring the FBI into the picture for almost a year after it was first attacked, she says.

"There's some myth that if you report events to law enforcement, it's going to show up on the front pages of the paper the next day," Geide says. "It just doesn't work that way." Indeed, Geide and fellow FBI agents up and down the line refused to speak about the specifics of any computer attack for this article. Geide says the FBI's aim is to "not betray the confidences of victims."

Geide did talk about the various ways computers can be involved in criminal acts. They can be the target of a crime — such as the Florida case in which a hacker in Sweden commandeered emergency 911 computers, rendering them useless — as well as the crime's facilitator.

Indeed, computers are being used to commit crimes ranging from fraud, gambling and pornography to illegal funds transfer, pyramid or Ponzi schemes and intellectual property theft. And it's tough to catch perpetrators red-handed, Geide says, because the "evil fruits of a misdeed or even the criminal's tools can be parked on a neutral computer system."

Clearly, there are steps companies can take to cover their assets, according to Mike Noblett, unit chief of the FBI's CART. "The corporation has to decide early on what its response [to an attack] is going to be," Noblett says. But Noblett and Geide are quick to point out that taking steps to cut off an invader may only be a temporary patch. "If some outside influence wants access to your product or to your data, you can close one door, but they're going to bang on other doors until they get back in,"

ARMED ONLY WITH COMPUTERS, BUT DANGEROUS

An FBI/Computer Security Institute survey points to the toll computer crime is taking.

Type of attack	Number of companies	Average loss
Financial fraud	26	\$957,384
Theft of proprietary information	21	\$954,666
Telecom fraud	35	\$647,437
Unauthorized access	22	\$181,436
Sabotage	14	\$164,840
System penetration	22	\$132,250

Responses taken from base of 249 companies that were able to quantify losses.

Geide says.

Noblett also advises that any delay contacting law enforcement agencies about possible criminal activity may well damage or destroy key evidence.

Another tip to better secure your networks is to stay on top of firewall systems. The temptation at many sites is to install the code and forget it, Rapalus says. "There are holes in every firewall, you have to detect them, monitor them and audit them," she says.

Owens says companies also shouldn't underestimate the importance of personnel training. He calls for companies to institute background checks on employees as well as train front line personnel against "social engineering" attacks, in which a caller may pose as a systems administrator to obtain passwords and login information.

"A lot of this is simple, common-sense stuff," Owens says.

CITAC's Geide hammers home the importance of calling local FBI agents in at the front end of the process.

"Too many companies think they can handle this internally today and plug the holes," he says. But when you're dealing with the global Internet, an attacker you ward off today may come back to haunt some other portion of your net tomorrow.

"We can't win this battle ourselves," Geide says, once again encouraging private companies to secure their data, but call for help when needed.

"Engage us," he says. "We're ready." ■

FBI OFFERS TIPS FOR SECURING YOUR NETWORK

- Organize data into classified and nonclassified entities.
- Devise a logon banner to warn unauthorized users they are subject to monitoring.
- Turn audit trails on.
- Use keystroke-level monitoring if necessary.
- Ask carriers to trap and trace suspect phone.
- Install caller ID.
- Make backups of damaged or altered files and compare them against an original image of the file.
- Designate one person to secure potential evidence, including tape backups and printouts.
- Lock evidence in a cabinet with access limited to one person.
- Maintain a record of resources used to reestablish the system and locate the perpetrators.
- Encrypt files and transmissions.
- Use onetime password generators.
- Stay on top of firewalls, monitor access points and conduct frequent audits.
- Train frontline personnel to ward off social engineering attacks.

SOURCE: FBI WASHINGTON, D.C.

searching for the threads that make up economic espionage and terrorism.

To understand CITAC's role in national security, consider that the unit scrambled into action last August when a major power grid collapsed, leaving a sizable chunk of the southwestern U.S. in near chaos. CITAC agents analyzed the possibility

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Go online for more computer-related crime info:

- The FBI's National Computer Crime Squad Web page, where you'll find tips for battling network-related crime.
- The Computer Security Institute's home page, which has data on firewall products and the security survey it conducted with the FBI.
- The National Institute of Standards and Technology Computer Security Resource Clearinghouse, a source of security primers as well as up-to-date policy info on encryption, digital signatures and other security technologies.



www.nwfusion.com

Lee

Continued from page 1

Internet access worlds, but also added new pressures to deliver bigger, better services.

GTE Chairman and CEO Charles Lee recently talked with *Network World* Senior Writers Tim Greene and Denise Pappalardo about how he intends to morph the company into a one-stop shop for 'Net services.

DOING THINGS THE LEE WAY

Recent moves by GTE under Chairman and CEO Charles Lee:



SOURCE: IDC, FRAMINGHAM, MASS.

- ▶ Paid \$616 million to buy BBN and gain a presence in the data and Internet services market.
- ▶ Bought a long-distance fiber-optic network from Qwest Communications that will launch GTE's facilities-based long-distance market entry.
- ▶ Transformed its Telephone Operations group into an unregulated competitive local exchange carrier able to sell packages of voice, data and Internet services to customers, with no requirement to resell unbundled elements to competitors.

How does GTE plan to change its image of being only a local exchange carrier?

We saw the competition coming, and we saw the Telecom Act coming well before that, and we've been posturing this company for years. We're building our capabilities and building our strengths.

The first step is providing long-distance, and we're very pleased with that launch. [Editor's note: As of last year, GTE offers long-distance service in 50 states.] Second, we are growing our wireless operation through our new personal communications services franchises, providing us with further activities in the international marketplace. We have indicated we expect our revenue to be \$34 billion to \$38 billion by the year 2001. That's in contrast to \$21.3 billion in 1996. So you can see that's a growth rate of 10% to 12%.

Equally important is to develop our national sales, service and marketing organization, which we have founded and are about to launch.

And lastly, the most important thing of all is that execution is what's the ultimate test here. We've got to deliver on these promises, we've got to try to get our customers to be raving fans of GTE, and we've got to walk like we talk.

What are some of the promises users can expect to see delivered on first?

Our competitive local exchange company will be launch-

ing service outside our current wire-line franchises during 1997. Those plans are being finalized, and the specifics on them will be announced during the next several months.

The second promise that you'll see [delivered on] is that we will enhance and improve the overall delivery capability of today's Internet access provider, BBN. You will see that company dramatically grow in its stature.

So the plan is to bring BBN traffic over to GTE's network this year?

No, I didn't say anything about networks. I was talking more in generalities in terms of capabilities. I didn't say which network that was going to go on or how we were going to do it.

What's the best news you can deliver about GTE to the largest corporate users?

What GTE is doing is reinventing ourselves. We will have the broadest product line, and by that breadth of product line, I'm focusing on local exchange, I'm focusing on long-distance, I'm talking about international [phone service], I'm talking about wireless, I'm talking about wire-line, I'm talking about paging, I'm talking about data transmission and particularly Internet access service.

A lot of other companies have similar goals. How are you better suited to attain these goals?

AT&T was at least thinking about finding a way to develop their local exchange service through that [now defunct] discussion with SBC [Communications, Inc.] We're already there. We cover in local service — in either wireless or wire-line — 30% of the United States. We now provide long-distance service in 50 states. With BBN and the other elements of our data strategy, we will be providing service — again selectively, depending on where we think we can have the most impact across the

United States. No RBOC can provide the kind of services we can provide today, nor can any long-distance company.

How do you see competition emerging based on the Telecom Reform Act? The initial reaction of some of the established companies is to merge.

Competition will evolve when people realize there is no slam-dunk. These competitors of ours who are spending so much time and energy in Washington, D.C., trying to get subsidies from the local exchange carriers are eventually going to learn that's not going to work, and then they're going to have to build some networks. If they want to resell our

capabilities, they're going to pay a fair price. We are not going to subsidize [British Telecommunications plc] via MCI [Communications Corp.]. We're not going to subsidize AT&T.

Should we expect further acquisitions by GTE along the scale of BBN?

We have lots of customers, we have lots of friends, and we have lots of partners, and we're constantly looking for opportunities to make our company grow even more — or to lessen the risk involved in this program. We will continue to talk to these individuals, talk to these companies and there may or may not be additional acquisitions.

It sounds like you're at least talking about a big marketing thrust for BBN.

You're right. Now that's all got to be backed up by some operating changes as well. But I'm not sitting here trying to engineer BBN network. Even though I'm an engineer, I tell you what, I'm a metallurgical engineer. They try to keep me away from it. I'll screw it up. In fact, someone's trying to train me how to use the Internet now.

So you're not on the 'Net?

No. Infrequently. Actually, I don't have time... All these great support people in our organization keep me so busy I don't have any time to get on the Internet. ■

HDSL2

Continued from page 1

available by mid-1998 for carriers and customers.

As users order more lines and new carriers lease additional lines from established carriers, pairs of copper wires will become scarce. "A service that takes one copper pair is a lot more useful than something that takes two," said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

HDSL2 would offer all the features of HDSL, the four-wire technology used now to provision most new 1.5M bit/sec T-1 services. HDSL has been a major factor in pushing T-1 prices lower because it works over longer distances without repeaters to install and maintain, Nolle said. HDSL has helped several carriers offer T-1 prices at a lower cost (see graphic, right).

Like its four-wire sibling, HDSL2 can coexist peacefully with other services supported in the same telephone company cable. It is quiet enough not to disturb neighboring transmissions and indifferent to noise generated by other wires. In that regard, it has advantages over some other DSL technologies, which can disturb and be disturbed by other services.

Still, HDSL2 is expected to complement rather than dis-

place other DSL services, each of which tends to serve its own purpose, said users and analysts.

"I'm not interested in T-1s," said Doug Siebert, director of computing facilities for the Division of Mathematics at the University of Iowa. Rather, he would be happy with asymmetric DSL, which the university is trying to obtain to support faculty members who telecommute.

Siebert is attracted to ADSL's download speeds of up to 8M bit/sec, even though the service only supports 1.5M bit/sec upstream. For him, symmetry does not matter.

But for applications that require equal bandwidth in both directions — such as interconnecting LANs — HDSL and HDSL2 will be the answer, said Kieran Taylor, broadband analyst at TeleChoice, Inc., a consultancy in Verona, N.J. In fact, HDSL2 could be used to carry any traffic now carried over traditional T-1s, including voice and data, Taylor said.

The technology also will be appealing to alternative carriers trying to make inroads against established local exchange carriers (LEC) that control local phone wiring. Alternative carriers could lease copper lines from the LECs and offer T-1 competition, sparking a price war that could drive prices down.

Competition has been the main reason for falling NYNEX

Corp. T-1 prices, said Colin O'Garro, a T-1 product manager for the carrier. Prices have fallen even without using HDSL, he said.

Because HDSL2 uses one copper pair instead of two, the technology also would stretch the limited supply of copper lines that are being snapped up by customers to support a second dial-up phone line for faxes and modems or other uses.

Given that the latest HDSL2 proposal is based on an implementation of Adtran's earlier proposal, vendors are hopeful that they might unite behind a single standard.

Driving down T-1 prices

Carriers using HDSL to provision T-1 circuits have shown dramatic price cuts.

Carrier	Monthly T-1 price	
	1994	1996
Pacific Bell	\$348	\$250
US WEST	\$441	\$340

Source: CIMI CORP., VOORHEES, N.J.

HDSL actually has evolved without a standard, making every vendor's hardware proprietary. To get HDSL to work, carriers and customers are stuck buying all their equipment from the same vendor. An HDSL2 standard would ensure interoperability and encourage competition that would drive prices as low as possible, Taylor said. ■

HDSL2 vs. other DSL technologies

Technology	Speed	Wire pairs required	Crosstalk problems	Hardware availability
▶ High-bit-rate digital subscriber line (HDSL)	1.5M bit/sec both ways	2	No	Now
▶ HDSL2	1.5M bit/sec both ways	1	No	1998
▶ Asymmetric DSL	8M bit/sec toward the user, 1.5M bit/sec away from the user	1	Yes	Now

Backspin

Coffee: Driving the computer industry now or in the future?

Coffee. What IT shop can operate without it? You know, that wonderful, aromatic brew in the staff lounge at 9 a.m. that turns into a viscous, stomach-burning, gut-wrenching, black ooze by 4 p.m. But in IT, we just can't live without it, whatever state it's in.

Now it was with some amusement that I read that a nice, hot cup of coffee may one day be pressed into service as a supercomputer. I came across this gem on the site Tasty Bits from the Technology Front (www.tbtf.com).

The background to this improbable idea lies in quantum physics and the limitations of conventional computers. With chips, speed depends on how much you can minimize the size of various chip features. Of course, the limit comes when you get features so small you're effectively handling single electrons.

Interestingly, the smaller the feature size, the more expensive the fabrication process. This, in turn, makes the fabrication ("fab" plant) correspondingly more expensive. Supposedly, if we could build chips that handle single electrons, the cost of the fab plant would equal the gross national product of every country on the planet.

A nice, hot cup of coffee would be a fine collection of particles to use as qubits.

A hope lies in quantum physics. But quantum physics only applies to the sub-atomic level, which is where the quantum properties of matter become detectable. And this is where something called "quantum logic" comes in: A particle (an electron, a photon, an atomic nucleus, etc.) can be in multiple states simultaneously. It can, in effect, represent 0 and 1 at the same time.

Now you're probably about to frame a deep-penetrating question such as "What?" and I'm right there with you. This is desperately weird stuff, and I'm not about to make the slightest attempt to explain it.

But not because I'm short of space or anything—I don't understand it, either.

But the potential's this: Where a regular computer working with, say, a 24-bit word

could, at any moment, represent any of 8,388,608 values, a quantum computer with 24 quantum bits (or, as they snappily call them, qubits) could represent all 8,388,608 values *at the same time* because each qubit can be in multiple states.

If the term that springs to mind at this point is "massively parallel," you are quite right. That is, indeed, what this beast is. Or, at least, will be if they can build it.

With such a machine, cracking real encryption codes—typically a problem of finding the prime factors of large numbers—becomes practical. In 1994, 1,600 computers on the Internet took

eight months to find the prime factors of a 129-digit number. If they were to try the same thing with a 250-digit number, it would take about 800,000 years.

On the other hand, a 30-qubit computer would be capable of knocking off the prime factors of a *thousand-digit* number in a mere 20 minutes! That's real horsepower by anyone's standard.

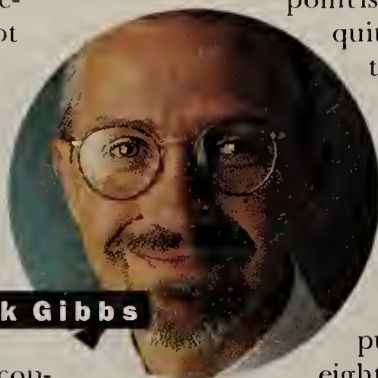
It turns out that using individual particles as qubits is tricky. As soon as you try to determine the state of the particle, your observation stops the process of computation (good ol' Heisenberg's uncertainty principle at work).

So some bright chaps at MIT (<http://physics.www.media.mit.edu/projects/spins/home.html>) have come up with the idea of using lots of particles at the same time, all doing the same thing. They reason that if all the particles are doing the same calculation, determining the state of a small number of them still leaves the rest to complete the process.

They suggest that a nice, hot cup of coffee would be a fine collection of particles to use as qubits. Actually, in a real machine, they would use a complex, purified molecule such as caffeine. Using a technique called nuclear magnetic resonance—which is just a matter of shoving radio waves into the liquid to induce the computing "states" and detect the magnetic response of the atoms—a quantum computer may one day be built. And the hardware required is cheap.

So in the future, we may be able to honestly say that the computer industry does, indeed, run on caffeine.

How many MIPS to the sip? Let me know at nwcolumn@gibbs.com or (800) 622-1108, Ext. 504.



Mark Gibbs



'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

VISICALC INVENTOR TO TAKE ON MICROSOFT? VisiCalc spreadsheet cocreator Dan Bricklin is set to launch a Web content creation software start-up designed to compete with Microsoft's FrontPage authoring tool, 'Net Buzz sources say.

The company, **Trellix Corp.**, is based in Waltham, Mass. Industry veteran **Russ Werner**, coming off a brief stint as vice president of new media at **Sybase, Inc.**, has been tapped as president and CEO.

One source tells us the company may unveil its new product as early as this month. Another says the content creation software is being tested by three beta customers and is intended to be a "FrontPage killer."

Werner declined to confirm any details of Trellix's plans.

ONDISPLAY IS ON A ROLE Successfully launching a new Internet product is an expensive undertaking. Buying off trade journalists alone can cost several dollars, and that's not counting the extra-large vendor T-shirts and shiny trinkets with which we are so easily swayed.



But thanks to a fresh infusion of venture capital, start-up **OnDisplay, Inc.**, of San Ramon, Calif., is ready to play the payola game with the best of them.

OnDisplay has just wrapped up a \$6.7 million second round of funding with several venture firms, according to **Mark Pine**, president and CEO of the 1-year-old company.

The money will be used to fund sales and distribution efforts for OnDisplay's **CenterStage**, software using Java-scripted agents that extract and process data from HTML documents on the Web.

Announced in March, a commercial version of CenterStage for Windows 95 and NT has just been made available. A Unix version is slated for release later this summer.

Second-round investors include **Matrix Partners**, **Atlas Ventures**, **Norwest Venture Capital** and **Colman Partners**. Matrix and Atlas teamed up for a \$3.5 million first-round funding deal last August.

THE REALITY CHECK IS IN THE E-MAIL If you buy the assertions of "free e-mail" vendors, they're signing up subscribers faster than **Bill Gates** buys out competitors.

Hotmail Corp., of Sunnyvale, Calif., says it has 4.5 million subscribers. **Juno Online Services** of New York claims 2.4 million members. And now **USA.NET** of Colorado Springs says it has signed up one million subscribers in six months.

These numbers don't add up for **Paul Hoffman**, director of the **Internet Mail Consortium**, an industry trade group based in Santa Cruz, Calif. Hoffman figures there are anywhere from 55 million to 75 million e-mail addresses in the U.S.

"I would be very surprised if free e-mail made up even 10% of that," he says. "I could believe maybe 5%."

Hoffman says he suspects many of the "subscribers" claimed by Juno and Hotmail merely sign up for the advertiser-supported service but never use it.

JUST PUT A 'FLAME ME' SIGN ON THEIR BACKS How little the federal government truly understands the cyberspace community was revealed last week when the Department of Commerce invited the public to submit comments and concerns regarding the Internet Domain Name System.

Soliciting input on any subject from millions of Americans armed with modems, e-mail and impassioned opinions betrays questionable judgement. But calling for comments on one of the hot-button issues splitting the Internet community is tantamount to requesting a server meltdown.

Of course, sorting the replies should be easy since most of us are sure to follow the 28-question discussion framework apparently devised by the Internal Revenue Service.

The deadline for submitting comments to dns@ntia.doc.gov is Aug. 18. More information can be found at www.ntia.doc.gov.

Don't let the one million tips we get per week dissuade you from sending 'Net Buzz your best Internet- and intranet-related news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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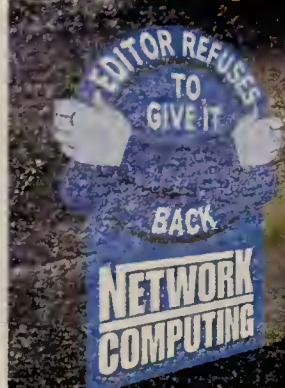
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THIS JUST IN ...

- Cabletron's SmartSwitch wins Network World's 1997 Intranet Excellence Award in the Infrastructure category.
- Data Communications recognizes SmartSwitches and SecureFast with its "Tester's Choice" award saying the solution "works with every type of VLAN and makes management a breeze."

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- *Network Computing* recognized Cabletron's SmartSwitches with its "Editor's Choice" and "Editor Refuses to Give it Back" awards based on industry-leading speed and ease-of-use.
- In a lab test among leading switches, *Communications Week* gave the SmartSwitches its "Max Award" proclaiming Cabletron "...the only vendor to have fully implemented the use of policy-based VLANs."
- After a study conducted by the Harvard Network Device Test Lab, Scott Bradner remarked that the Fast Ethernet SmartSwitch was "...the fastest internetworking device I have yet seen."
- And in another test of leading Ethernet and Fast Ethernet solutions, the Tolly Group found the SmartSwitch offers outstanding VLAN and RMON support.
- Cabletron scored highest in VLAN management in McConnell Consulting's "VLANs: Head-to-Head," a comprehensive evaluation of 12 leading vendors' solutions.
- During the Switching Showdown at Comnet '97, Cabletron garnered over 50% of the vote in a *Network World* audience poll.
- For the second year in a row, *Network Magazine* (formerly *LAN Magazine*) awarded Cabletron's SPECTRUM enterprise management solution its 1997 Product of the Year in the category of Management Platform.
- In WAN switching, Cabletron's FRX4000 frame relay solution from CSI Netlink won the annual "Tester's Choice" award handed out by *Data Communications*.

Cabletron's award-winning team is proud of the recognition it has earned from pundits and publications alike. And if our solutions excel in a closely watched lab environment, imagine how they perform in customers' real-world business networks. We're simply honored about passing that test.

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